

FLORA OF TROPICAL AFRICA.

Vol. V.—Part I.

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FLORA

OF

TROPICAL AFRICA.

D. Oliver

EDITED BY

SIR WILLIAM T. THISSELTON-DYER
K.C.M.G., C.I.E., LL.D., F.R.S.

HONORARY STUDENT OF CHRIST CHURCH, OXFORD
DIRECTOR, ROYAL BOTANIC GARDENS, KEW.

PUBLISHED UNDER THE AUTHORITY OF THE FIRST COMMISSIONER
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SIR W. T. THISELTON-DYER, K.C.M.G., C.I.E.,
LL.D., F.R.S., ETC.

DIRECTOR, ROYAL BOTANIC GARDENS, KEW.

VOL. V.

ACANTHACEÆ TO PLANTAGINEÆ.

PUBLISHED UNDER THE AUTHORITY OF THE FIRST COMMISSIONER
OF HER MAJESTY'S WORKS AND PUBLIC BUILDINGS.



LONDON:

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OF THIS VOLUME.

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PREFACE.

THE seventh volume of the Flora of Tropical Africa was completed in 1898. The circumstances under which the work was resumed are stated in the preface.

The choice of the next instalment to be taken up was mainly determined by the assistance I was able to secure from contributors. Amongst these I am more especially indebted to my friend Mr. C. B. Clarke, F.R.S., who not merely undertook the difficult task of elaborating the *Acanthaceæ*, which occupy half the volume, but made a journey to Berlin to study the material preserved in the herbarium of the Royal Botanic Museum.

For the amended definition of the regions into which the area of the flora is divided reference may be made to the preface to the seventh volume.

In the prefaces to the first and seventh volumes will be found an enumeration of the materials employed up to 1868 and of the most important additions to them which have reached Kew since. The only further collections at Kew cited in the present volume are:—

III. NILE LAND. J. Theodore Bent. Collection from the coast region of Nubia in 1895–6. (Died 1897.)

IV. LOWER GUINEA. Dr. Ch. Bommer, Brussels. A collection of Lindner's Damaraland plants.

VI. MOZAMBIQUE. Professor C. Fritsch, Graz. A collection made in the Zambesi Valley at Boruma by Father L. Menyharth, S. J. (Died 1899.)

The present volume was ready for the press at the beginning of

1898. The inconvenience of the delay in publication is obvious. The contributors see other writers secure the priority of their work, while the manuscript has continually to be re-written to incorporate what has been published while it is waiting for the printer. For all this I am in no way responsible. I prepare the work; but over printing and publication I have not the slightest control. And as no less than five government departments have a say in the matter, the task of getting them into line is one of no small difficulty. A fire which took place at the printer's in December of last year was a further impediment. Fortunately, however, most of the manuscript was recovered eventually from the ruins.

Three more volumes will complete the work as originally planned. Their preparation presents no inherent difficulty, but their fate lies on the lap of the gods.

I must again record my acknowledgements of the assistance given me by Mr. C. H. Wright in preparing the manuscript for the press and in checking the proofs, and to Mr. N. E. Brown for working out the geographical distribution.

W. T. T. D.

KEW, *November* 1900.

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CONSPECTUS OF THE ORDERS CONTAINED IN
THE FIFTH VOLUME.

CLASS I. DICOTYLEDONES.

SUBCLASS II. GAMOPETALÆ.

Cohort xxiv. Personales (continued).—*Corolla more or less irregular or oblique. Stamens 5-2; when 5 the posticous smaller than the others or infertile. Ovary superior, of 2 carpels. Ovules sometimes 2 to each carpel, usually more, often numerous, if 2 superposed, or in a few genera collateral. Fruit usually a capsule.*

XCVIII. ACANTHACEÆ. Calyx divided nearly to the base. Ovary 2-celled (1-celled in *Afromendonia*); ovules 2 in each cell or more, superposed (collateral in *Thunbergia* and *Afromendonia*), rarely solitary. Fruit a loculicidal capsule (a drupe in *Afromendonia* and *Gilletiella*); valves of the capsule often rising elastically. Seeds exalbuminous, borne on retinacula except in the first five genera, *Hiernia* and *Gilletiella*.

Cohort xxv. Lamiales.—*Corolla more or less irregular or oblique. Perfect stamens 4 or 2, the posticous absent or at least infertile. Ovary superior, of 2 carpels, rarely 1 by abortion, each with 1 or 2 collateral ovules, or very rarely with more. Fruit usually enclosed in the calyx, of 1-seeded (rarely 2- or more-seeded) nucules, very rarely dehiscent.*

XCIX. MYOPORINEÆ. Shrubs, rarely trees, usually with simple alternate leaves. Flowers axillary. Ovary normally 2-celled but often spuriously many-celled. Radicle superior.

C. SELAGINEÆ. Small heath-like shrubs or undershrubs, or tufted perennial herbs, usually with simple alternate leaves. Flowers in terminal spikes or corymbose panicles. Ovary 2-celled, or 1-celled by abortion. Radicle superior.

CI. VERBENACEÆ. Herbs, shrubs, or trees. Leaves usually opposite, simple or digitate. Ovary entire or slightly lobed, 2-4 celled or rarely 8-celled (*Duranta*); style terminal. Fruit drupaceous, containing 2-4 (rarely 1) bony pyrenes, or dry and separating into nucules, or very rarely dehiscent. Radicle inferior.

CII. LABIATÆ. Herbs, more rarely shrubs. Leaves almost always opposite and simple. Ovary deeply 4-lobed; style produced from between the lobes. Fruit of 4 nucules. Radicle inferior.

Anomalous Order.

CIII. PLANTAGINEÆ. Scapigerous herbs. Leaves usually radical. Flowers spicate, small, usually hermaphrodite. Corolla 4-lobed. Stamens 4. Capsule circumscissile or indehiscent; 1- or more-seeded.

FLORA OF TROPICAL AFRICA.

ORDER XCVIII. ACANTHACEÆ. (By I. H. Burkill and C. B. Clarke.)

Flowers hermaphrodite, irregular. Calyx inferior, free; segments 5 or 4, nearly separate or sometimes more or less united. Corolla gamopetalous; tube campanulate or linear; limb 2-lipped, or 5-lobed, more or less 1-sided. Stamens on the corolla, 4 didynamous, or 2 (with or without rudiments); anther-cells 2 or 1, at base rounded, acute, or tailed, parallel at equal height, or one above the other more or less oblique; pollen ellipsoid (then usually ribbed or banded longitudinally), or globose (then often honeycombed, reticulate or echinulate); equatorial pores 2, 3, 6, closed by stopples, for protrusion of pollen-tubes. Ovary superior, 2-celled; ovules superimposed in 1-2 rows or solitary (2, collateral in *Thunbergia*, *Afromendoncia*), anatropous or obscurely amphitropous; style long, simple, minutely 2-fid. Capsule loculicidal, often elastically dehiscent (in *Afromendoncia* a drupe); seeds usually nearly as many as ovules, held up on the thickened up-curved outgrowth of the funicle, the *retinaculum* (except in the first 5 genera), compressed laterally; albumen 0 (except in the *Nelsoniaceæ*).—Herbs or shrubs, 1 or arborescent. Leaves opposite; stipules 0. Inflorescence various, in umbelliform spikes, or heads, or lateral or terminal clusters; or flowers solitary, paniced or axillary; bracts large or small or 0.

An Order consisting of 140 genera and 2000 species, abundant in the tropics, frequent in temperate climates, absent from Alpine and Arctic regions.

In the tribe *Ruellieæ*, there is frequently a large anterior bract to the sessile flower, and 2 lateral bracteoles between this and the flower. In the *Eujusticieæ*, it is frequently so difficult to distinguish the bract from the bracteoles that little use is made of the character for descriptive purposes. In several cases, as in *Phaylopsis*, there are flowers subsessile in the axil of each (apparent) bract; in such a case in the present work each flower is then considered to be strictly without bract or bracteole, and the "bract" enclosing an inflorescence is termed frequently a floral leaf.

This terminology is merely descriptive; for it very frequently happens that a minute shoot, sometimes bearing a flower, appears inside the lateral bracteole. Also

in some strobilate spikes, the upper bracts may contain a solitary flower each, while lower "bracts" on the same spike may contain 2 or 3 flowers, and (though beyond question homologous with the upper bracts) be termed, therefore, floral leaves.

The characters taken from the pollen are exceedingly useful in determining whether a single flower in a scrappy specimen is a *Ruellia* or a *Dyschoriste*. But it must not be supposed that the characters taken from pollen are more "absolute" than other characters. Thus, Lindau calls the ellipsoid pollen of *Lepidagathis* "honey-combed," but he adds a caution that it is in many species only reticulated; and, in some species, I should say that this reticulation is so broken and imperfect that it cannot be differentiated from the granulated patches very generally present. In other words, I consider that there is a perfectly graduated series of pollen in the *Acanthaceæ* from honeycombed through reticulated to smooth; and above all in the *Eujusticieæ*, I consider that there is a complete gradation from the "tubercled" pollen characteristic of *Justicia* proper to that of *Nicoteba* (Lindau), *Duvernoia*, or *Rhaphidospora*.

The difficulty, however, of subdividing *Justicia*, so that it may be possible to locate a species definitely in one of its subgenera, is so enormous that any character which assists to such a desired consummation should be welcomed. When, however, Lindau throws over inflorescence, bracts, anther-cells and anther-tails, capsule-dehiscence, number of seeds, nature of seed-coat, and forms a genus *Nicoteba* or *Duvernoia* on pollen-characters only, we find the group contrary to nature itself; it appears to me not a genus, but a handful of species taken at random from every part of the genus *Justicia* (in a very wide sense). Nor am I able, by such pollen-characters, to refer a plant to its genus.

Throughout the Order, the most valuable characters for forming the larger groups appear to be the number of ovules (either 2-1, or 3-several, in each cell), the number of stamens, the capsule and seeds. The combination of species in the Genera Plantarum made by Bentham, on a mixture of these characters, appear to place like with like much better than giving the pollen-characters a predominating value.

Both Bentham and Lindau follow their predecessors in giving a high value to the elastic rising of the placenta in the fruit of *Rungia*, &c. I have here followed them; but the giving this character a prepotent influence appears to me to separate like from like nearly as flagrantly as the pollen-character when similarly applied as of predominant value (see the observations in table of genera upon *Rungia*, *Macrorungia*, *Dicliptera*).

The large strong retinacula holding up the seeds usually suffice to refer a plant to this Order. The first 3 genera, where this character fails, are so strongly marked in other ways that they are easily recognised. A special eye should be kept on *Nelsonia* and *Synnema*, as these plants have been sometimes, on a hasty inspection, sorted into *Scrophulariaceæ*.

Excluded genera.

COINOCHEILON, *T. Anders.*, is Loganiaceous.

CYCLOCHEILON, *Oliver*, is Verbenaceous.

TRIBE I. **Thunbergiææ.**—*Corolla-lobes contorted in the bud (no lobe wholly within or wholly without the others). Two collateral ovules in each cell. Seeds globose or orbicular, without retinacula.*

Fruit fleshy with one cell only	1. AFROMENDONCIA.
Fruit dry with a distinct beak, 2-celled	2. THUNBERGIA.

TRIBE II. **Nelsoniææ.**—*Calyx in the African species 4-partite. Corolla-lobes imbricate, the posterior lobes outermost. Stamens 2. Ovules in each cell many superposed in two series. Seeds small, globose, without retinacula.*

Spikes dense, slender, covered with bracts below the flowering portion	3. ELYTRARIA.
Spikes dense, more or less ovate, sessile or with a naked peduncle	4. NELSONIA.

TRIBE III. **Ruellieæ**.—Corolla-lobes contorted in the bud (no lobe wholly without or wholly within the others). Stamens 4 polliniferous (except in *Brillantaisia*, *Lankesteria*); anther-cells at equal height; pollen of 3 forms, viz. (a) globose, honey-combed or reticulated; (b) globose, echinulate or nearly smooth; (c) ellipsoid, with (9–15) narrow longitudinal smooth grooves. Calyx or bracteoles often conspicuous. Seeds (in all but two or three small genera) discoid, covered, at least on margins, with many extremely fine hairs which spring out on applying water.

Subtribe i. **HYGROPHILEÆ**.—Ovules 3 or more in each cell; capsule (unless accidentally) many-seeded. Corolla distinctly 2-lipped (see also *Mellera* among the *Euruellieæ*).

Retinacula very small, conical, not curved; seeds without hygroscopic hairs.—Small herbs 5. **SYNNEMA**.

Retinacula curved; seeds with hygroscopic hairs; anther-cells muticous; pollen ellipsoid, ribbed longitudinally.

Stamens 4 6. **HYGROPHILA**.

Stamens 2. Flowers large or medium 7. **BRILLANTAISIA**.

Subtribe ii. **EURUELLIÆ**.—Ovules 3 or more in each cell; capsule many-seeded. Corolla not (or indistinctly) 2-lipped (in *Mellera*, the anticous lobe of corolla is ovate, twice as broad as the others).

Pollen globose; surface honeycombed or reticulated. (Stamens 4; anthers muticous; inflorescence not strobilate.)

Leaves in subequal pairs, subequal at the base 8. **RUELLIA**.

Leaves in unequal pairs, oblique at the base 9. **ENDOSIPHON**.

Pollen ellipsoid, with 9–15 narrow longitudinal smooth grooves.

Flowers large, laxly or closely paniced. Large plants.

Corolla 2-lipped, anticous lobe twice as broad as the others 10. **MELLERA**.

Corolla not 2-lipped.

Anther-cells 8, muticous 11. **PAULOWILHELMIA**.

Anther-cells 6, muticous, 2 long-spurred 12. **MIMULOPSIS**.

Anther-cells 4; calyx cylindric, ribbed 13. **PHYSACANTHUS**.

Flowers in axillary clusters; corolla scarcely $\frac{1}{3}$ in. long 14. **HEMIGRAPHIS**.

Flowers solitary; corolla 1–1 $\frac{1}{2}$ in. long; leaves linear . 15. **RUELLIOPSIS**.

Pollen globose, echinate. Three posticous calyx-lobes connate more than half their length (except in *D. thunbergiiflorus*)

. 16. **DISTICHOCALYX**.

Subtribe iii. **STROBILANTHÆ**.—Ovules 2 or 1 in each cell. Corolla not or obscurely 2-lipped.

Valves of the placenta not rising elastically from the base of the capsule so as to throw out the seeds.

Pollen globose, echinate or nearly smooth.

Pollen strongly echinate 17. **ACANTHOPALE**.

Pollen minutely echinate, nearly smooth. Sepals large subcorolloid. Seeds without elastic hairs 18. **WHITFIELDIA**.

Pollen globose, honeycombed or reticulate.

Stamens 4. Calyx cylindric, 5-ribbed 19. **SATANOCRATER**.

Stamens 2 20. **LANKESTERIA**.

Pollen ellipsoid, with 9–15 narrow longitudinal smooth bands.

Capsule cylindric, 4-seeded 21. **DYSCHORISTE**.

Capsule ellipsoid, flattened, 2-seeded 22. **DISPERMA**.

Valves of the placenta rising elastically from the base of the ripe capsule so as to throw out the seeds.

- Floral leaf containing 3-1 ebracteate ebracteolate flowers 23. PHAYLOPSIS.
Each flower with 2 large ovate or elliptic bracteoles . 24. PETALIDIUM.

TRIBE IV. **Acantheæ.**—*Corolla 1-lipped; tube short. Stamens 4; anthers 1-celled; pollen ellipsoid or subglobose, with longitudinal bands. Ovary with 2-1 ovules in each cell.*

Calyx 4-partite to the base. Posticous lip of corolla wanting.

- Seeds hygroscopically hairy 25. BLEPHARIS.
Seeds without hairs 26. ACANTHUS.

Calyx 5-partite to the base. Corolla limb split down the posticous face, so that the lip has 5 lobes all on one side.

- Sepals all similar, posticous 1-nerved 27. SCLEROCHITON.
Posticous sepal larger, 2-nerved, often 2-toothed at the tip 28. CROSSANDRA.

TRIBE V. **Justicieæ.**—*Corolla-limb subequally 5-lobed or 2-lipped, one lobe wholly within, one wholly without in the bud. Ovules 2-1 in each cell (except Crabbea). Seeds without hygroscopic hairs.*

Subtribe i. **TETRANDRÆ.**—Stamens 4, all fertile; anther-cells rounded at the base.

- Ovules 3 or more in each cell. Corolla 2-lipped; anther-cells 2 29. CRABBEA.

Ovules 2-1 in each cell.

Corolla distinctly 2-lipped. Pollen short ellipsoid, longitudinally marked.

Calyx 5-fid.

- Racemes elongated, many-flowered 30. THOMANDERSIA.
Spikes short, sometimes unilateral, bracteate 31. LEPIDAGATHIS.
Calyx 4-fid. Flowers scattered subsolitary 32. LINDAUEA.

Corolla not distinctly 2-lipped.

Corolla inflated upwards, mouth oblique; posticous stamens with 2-celled anthers.

- Anther-cells at equal height 33. ASYSTASIA.
One anther-cell below the other, smaller 34. FILETIA.
Corolla-mouth funnel-shaped, hardly oblique; posticous stamens with 1-celled anthers 35. NEURACANTHUS.

Subtribe ii. **BARLERIÆ.**—Stamens 2 fertile, 2 small rudimentary often added. Calyx large, 4-partite to the base, *i.e.*, 2 anticous lobes connate nearly or quite to the tip. Anther-cells 2, rounded at base; pollen globose, reticulated 36. BARLERIA.

Subtribe iii. **ERANTHEMEÆ.**—Stamens 2. Corolla-tube long, linear; limb subequally 5-fid, spreading. Anther-cells rounded at base; pollen subglobose, slenderly marked longitudinally.

- Anther-cells 2, at equal height 37. ERANTHEMUM.
Anther-cell 1 38. RUSPOLIA.

Subtribe iv. **EJUSTICIEÆ.**—Stamens 2. Corolla distinctly 2-lipped. Calyx small or slender, or enclosed by bracts or bracteoles, 5-fid (except in a few species of *Justicia*). Seeds tubercular or smooth, without needle-like hygroscopic hairs, rarely with stiff or minute scabrous hairs.

Sect. i. *Monothecieæ*.—Anthers 1-celled. The flower not appearing as though enclosed between 2 opposite bracts. Placentæ not rising elastically from the base of the capsule.

- Corolla more than 1 in. long ; tube broad, cylindric 39. RUTTYA.
- Corolla small or slender.
- Corolla-tube cylindric 40. MONOTHECIUM.
- Corolla-tube very short 41. OREACANTHUS.
- Corolla-tube linear, $\frac{2}{3}$ – $1\frac{1}{4}$ in. long 42. BRACHYSTEPHANUS.

Sect. ii. *Typicæ*.—Anthers 2-celled. The flower not appearing as though enclosed between 2 opposite bracts. Placentæ not rising elastically from the base of the capsule.

One anther cell below the other, distinctly tailed.

- Capsule usually 4-seeded ; seeds rough or tubercled (see 56. *Rungia*) 43. JUSTICIA.

- Capsule 2-seeded ; seeds smooth, shining, rarely with minute scabrous or stiff hairs 44. MONECHMA.

One anther-cell somewhat below the other, at base rounded or mucronate (or hardly tailed in *Adhatoda*).

- Corolla large, or long.
- Corolla-tube broad. Large-leaved shrubs 45. ADHATODA.
- Corolla-tube long linear ; posticous lip small 46. RHINACANTHUS.
- Corolla-tube short ; lips very long (see 57. *Macrorungia*) 47. ANISOTES.

Corolla slender. Panicle many-flowered, rather close.

- Floral leaves inconspicuous. Pollen globose, flattened, with 2 stopples 48. ISOGLOSSA.

- Floral leaves (at least in the type species) conspicuous. Pollen globose with 6 equatorial stopples 49. CHLAMYDOCARDIA.

Anther-cells at equal height, rounded at the base.

- Bracts or floral leaves broad. Capsule 2-seeded
- Bracts strobilate, with only 1 flower under each 50. ECBOLIUM.
- Floral leaves axillary or shortly spicate with 3–1 ebracteate flowers under each 51. MEGALOCHELYMUS.

Bracts narrow or small. Capsule 4-seeded.

- Corolla large ; tube $\frac{3}{4}$ in. long 52. GRAPTOPHYLLUM.
- Corolla slender ; tube $\frac{1}{2}$ in. long 53. SCHAUERIA.

Sect. iii. *Hypoestecæ*.—Placentæ not rising elastically in fruit. The flower appearing as though enclosed between two oblong opposite bracts (sometimes connate into a tube).

- Anther-cells 2, 1 much above the other (see 58. *Dicliptera*) 54. PERISTROPHE.
- Anthers 1-celled 55. HYPOESTES

Sect. iv. *Solutæ*.—Placentæ rising elastically in fruit, separating from the capsule-valves at the base, and throwing out the seeds. Capsule ovoid, flattened ; faces with firm raised margins.

Spikes strobilate with 1 flower under each broad bract.

- Corolla-lips not longer than tube. (Only differs from *Justicia* sect. *Betonica*, or *Adhatoda*, by the elastically rising placentæ 56. RUNGIA.

- Corolla-lips much longer than tube. (Only differs from *Anisotes* by the elastically rising placentæ) 57. MACRORUNGIA.

- Spikelets with 1 perfect flower enclosed by 2 opposite bracts. (Only differs from *Peristrophe* by the elastically rising placentæ) 58. DICLIPTERA.

- Of doubtful position 59. HIERNIA.

1. **AFROMENDONCIA**, Gilg ex Lindau in Engl. Jahrb. xvii. 111.

Calyx cupular, minute, obsolete and unequally 5-lobed. Corolla-tube somewhat broadening upwards; limb distinctly bilabiate, with 5 spreading rounded lobes, or the upper two shorter, broader and reflexed. Stamens 4, didynamous, included, or the longer slightly exerted; anthers glabrous, subcordate at the base, apex more or less apiculate, cells slightly diverging below, dorsally affixed. Disc annular or cushion-like, fleshy, often half as long as the ovary. Ovary sessile, composed of two united carpels, 1-celled, 2-ovuled; ovules ascending from the base but affixed by the ventral suture nearly to the apex of the cell. Fruit drupaceous. Immature capsule oblong or roundish-oblong.—Tall woody climbing shrubs. Leaves opposite and decussate. Flowers in axillary fascicles. Bracteoles 2, petaloid or subfoliaceous, ovate or sometimes very broadly ovate.—Lindau in Engl. & Prantl, Pflanzenfam. iv., 3 B, 291. *Liraya*, Pierre in Bull. Mus. d'Hist. Nat. Paris, ii. 340, 341.

Bracteoles glabrous.

Bracteoles 4 lin. long 1. *A. lindaviana*.

Bracteoles 7-8 lin. long 2. *A. floribunda*.

Bracteoles villous.

Leaves ovate-oblong, not rugose 3. *A. gilgiana*.

Leaves broadly ovate or suborbicular, rugose 4. *A. phytocrenoides*.

1. **A. lindaviana**, Gilg ex Lindau in Engl. Jahrb. xvii. 112. A woody climber, "30 ft. high" (*Mann*). Stems twining, glabrous or sometimes pilose at the nodes, slender when young, when old 3-4 in. diam., twisted, sulcate and slightly canescent. Leaves petiolate, elliptic or oblong, cuspidate-acuminate, slightly undulate, somewhat coriaceous, glabrous, light reddish-purple beneath, $2\frac{1}{2}$ - $4\frac{1}{2}$ in. long, 1-2 in. broad; lateral nerves 3-4 pairs, anastomosing near the margin; petioles $\frac{3}{4}$ -1 in. long. Fascicles of flowers arising from axillary protuberances on the old leafless stems; pedicels slender, glabrous, 6-7 lin. long; bracteoles 2, ovate, acute, glabrous, enclosing the flower, 4 lin. long. Calyx very shortly cupulate; limb obsolete crenulate. Corolla scarcely twice as long as the bracteoles; tube short; lobes spreading, rounded. Stamens adnate to the upper part of the tube, the two longer slightly exerted; anthers cordate-oblong, shortly apiculate, somewhat unequal at the base. Style glabrous, slightly exerted, minutely bifurcated at the apex.—Oliv. in Ic. Pl. t. 2426; Gilg in Ber. Deutsch. Bot. Gesellsch. xi. 351.

Upper Guinea. Cameroons: Bipinde, *Zenker*, 965!

Lower Guinea. Gaboon: Corisco Bay, *Mann*, 1849! Munda; Sibange Farm, *Soyaux*, 156!

2. **A. floribunda**, *Burkill*. Leaves cuneate-obovate, cuspidate, obtuse at the base, glabrous above, hairy on the nerves beneath; lateral nerves about 8 pairs; petioles short. Flowers 4-6, in short axillary racemes, 2-5 lin. long; pedicels 8-9 lin. long; bracteoles 2, elliptic, acute glabrous, rather thick, nerved, about 6 lin. long. Calyx annular,

1 lin. long; with 5 small teeth. Corolla purplish, nearly included within the bracteoles; tube nearly straight; limb campanulate, with 5 nearly equal lobes, about 5 lin. long. Anthers oblong, 3 lin. long; filaments glandular-pilose at the base. Style 5 lin. long, bifid at the apex. Drupe elliptic-oblong, about 10 lin. long.—*Liraya floribunda*, Pierre in Bull. Mus. d'Hist. Nat. Paris, ii. 340, 342.

Lower Guinea. Gaboon: near Libreville, *Jolly*, 101.

Only known from the original description, in which it is said to differ from *Afromendoncia* in having pendulous ovules, but the agreement is so close in other respects as to suggest that, as Lindau recognises (Engl. & Prantl, Pflanzenfam. Nachtr. 304), it must be referred here. Mr. Clarke, who has seen a drawing of the plant, considers it very near to *A. lindaviana*, Gilg.

3. **A. gilgiana**, Lindau in Engl. Jahrb. xx. 1. Stems climbing, 4-angled, slender, villous-pubescent when young, afterwards glabrous. Leaves petiolate, oblong-ovate, shortly acuminate and apiculate, not rugose, $1\frac{3}{4}$ –3 in. long, $\frac{3}{4}$ – $1\frac{1}{2}$ in. broad; lateral nerves 5–6 pairs, anastomosing near the margin, pilose beneath; petioles $\frac{1}{2}$ – $1\frac{1}{4}$ in. long, villous. Flowers in axillary fascicles of 2 to 4 on the young branches; pedicels 6–9 lin. long, villous with fulvous hairs; bracteoles 2, broadly ovate, mucronulate, 5–6 lin. long, villous with fulvous hairs. Calyx very short, obscurely lobed. Corolla white; tube $\frac{3}{4}$ in. long, 1 lin. broad below, 3 lin. broad at apex; lobes rounded, somewhat spreading. Anthers 2 lin. long, acute, pilose at the base; filaments short. Style $\frac{3}{4}$ lin. long.—Lindau in Engl. & Prantl, Pflanzenfam. iv., 3 B, 290, 291, fig. 115, D–M.

Upper Guinea. Cameroons: Yaunde, *Zenker*, 439! between Barombi-ba-Mbu and Kake, *Preuss*, 439, 481!

Nile Land. British East Africa: Upper Ituri, West of Lake Albert, *Stuhlmann*.

A species with the facies of, and probably referable to, *A. gilgiana* has been collected in Uganda, *Scott-Elliott*, 7331! The specimens are unfortunately flowerless.

4. **A. phytocrenoides**, Gilg ex Lindau in Engl. Jahrb. xvii. 112. A woody climber, "30 ft. high" (*Mann*). Stems twining, stout, subterete, pilose when young, afterwards nearly glabrous. Leaves petiolate, broadly ovate or suborbicular, obtuse or shortly cuspidate, subcordate at the base, firm, rugose and glabrous above, stellate-pubescent and reticulated beneath, $3\frac{1}{2}$ – $6\frac{1}{2}$ in. long, $2\frac{1}{2}$ – $4\frac{1}{2}$ in. broad; margin somewhat undulate and revolute; lateral nerves 5–7 pairs; petioles 1– $1\frac{1}{4}$ in. long. Flowers in axillary fascicles of 2 to 6 on the young branches; pedicels 4–6 lin. long, villous with long fulvous hairs. Bracteoles 2, ovate, acute or cuspidate, $\frac{3}{4}$ –1 in. long, villous with long fulvous hairs. Calyx cupulate, very short, obscurely crenulate. Corolla-tube slightly exceeding the bracteoles; lobes roundish-oblong, somewhat spreading. Anthers linear-oblong, acute or apiculate, 3–4 lin. long, cordate-sagittate at the base; filaments short. Style slightly exserted, minutely bifurcate at the apex.—Oliv. in Ic. Pl. t. 2427. *Thunbergia phytocrenoides*, T. Anders. ex Lindau in Engl. Jahrb. xvii. 113.

Lower Guinea. Gaboon: River Muni, *Mann*, 1839!

2. **THUNBERGIA**, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1072.

Calyx with long teeth or truncate. Corolla conspicuous, white, or of various shades of yellow, blue, or purple; lobes 5, equal or nearly so, contorted. Stamens 4, enclosed in the tube of the corolla, on which near the base they are inserted. Pollen globose, smooth, reticulate or spiny. Disc fleshy, forming a ring round the ovary. Stigma 2-lipped or funnel-shaped, overtopping the anthers. Ovary with 2 collateral ovules in each cell. Capsule with a sterile beak above and a spherical fertile part below, loculicidal. Seeds ovoid or compressed dorsally, smooth or warted; hilum central; no retinacula.—Herbs or shrubs, erect or climbing, with flowers usually solitary, each protected by a pair of large bracteoles.—*Meyenia*, Nees in Wall. Pl. As. Rar. iii. 78. *Endomelas*, Rafin. Fl. Tellur. iv. 67.

A genus of about 75 species, chiefly African, extending into India, and by three species represented in Tropical Australia; in America as introduced plants. The genus readily falls into three sections, two of which are found in Tropical Africa.

***EUTHUNBERGIA**.—Stigma 2-lipped; calyx usually with long teeth

Shrubs; anthers without spur at the base (except in 9) but with a spiny crest on each lobe.

Bracteoles covered with hairs 1. *T. rufescens*.

Bracteoles glabrous, or only sparingly hairy.

Bracteoles leathery.

Leaves large, ovate 2. *T. vogeliana*.

Leaves small, cordate 3. *T. longisezata*.

Bracteoles membranous.

Calyx-teeth long.

Young branches hairy.

Leaves glabrous, except on the midrib 4. *T. malangana*.

Leaves scabrid beneath, and hairy along the veins 5. *T. adenocalyx*.

Young branches glabrous.

Peduncles less than 1½ in. long.

Leaves usually large; bracteoles more than 1 in. long 6. *T. affinis*.

Leaves small; bracteoles less than 1 in. long 7. *T. erecta*.

Peduncles 1½–2½ in. long 8. *T. crispa*.

Calyx truncate 9. *T. hookeriana*.

Herbs, for the most part climbing; anthers usually spurred below and with long hairs.

†Lobes of the stigma firm, the lower rounded (deltoid in 21 and not known in 11); corolla-tube usually widening to the throat.

Leaves sessile.

Leaves twice as long as broad, or longer.

Erect herbs; peduncles much shorter than the leaves.

Leaves upwards of 4 in. long, more or less hirsute 10. *T. annua*.

Leaves only 1 in. long, hispid 11. *T. hispida*.

Climber; peduncles exceeding the leaves 12. *T. paulitschkeana*.

Leaves with their breadth more than half their length.

- Leaves less than 1 in. long; corolla-tube 6-7
lin. long.
- Anthers acute, glabrous 13. *T. brewerioides*.
 Anthers obtuse, fringed with hairs 14. *T. sericea*.
 Leaves 2 in. long; corolla-tube 1 in. long 15. *T. Fischeri*.
- Leaves stalked.
- Flowers 2-3 together between 2 large sessile
 leaves 16. *T. fasciculata*.
- Flowers solitary.
- Bracteoles not keeled 17. *T. huillensis*.
 Bracteoles keeled.
- Petiole $\frac{1}{4}$ in. long 18. *T. hirsuta*.
 Petiole 1 in. or more long, often winged.
- Bracteoles pubescent.
- Bracteoles $1\frac{1}{2}$ in. long; lobes of stigma
 nearly 3 lin. broad 19. *T. Gibsoni*.
 Bracteoles 8-12 lin. long 20. *T. alata*.
 Bracteoles nearly $1\frac{1}{2}$ in. long; lobes of
 stigma 1- $1\frac{1}{2}$ lin. broad 21. *T. Erythrææ*.
 Bracteoles hispid, with tawny hairs,
 10-12 lin. long 22. *T. Gregorii*.
- †† Lobes of the stigma firm, the lower deltoid; tube of the
corolla widening but little upwards.
- Leaves sessile 23. *T. Cycnium*.
- Leaves stalked.
- Tube of corolla 4-7 in. long.
- Anther-lobes rounded below 24. *T. gigantea*.
 Anther-lobes acute below 25. *T. guerkeana*.
- Tube of corolla not more than $1\frac{1}{2}$ in. long.
- Leaves acute (in 27 sometimes rounded, mucro-
 nate).
- Leaves toothed along the margin 26. *T. hamata*.
 Leaves with one tooth at the base 27. *T. kirkiana*.
- Leaves obtuse.
- Leaves broadly ovate; flowers on long peduncles 28. *T. subalata*.
 Leaves narrowly elliptical; flowers on rather
 short peduncles 29. *T. Hanningtonii*.
- ††† Lobes of the stigma thin, equal or almost so, rounded
above and with acute angles at the sides.
- Leaves usually hastate, nearly glabrous.
- Corolla-tube less than 1 in. long 30. *T. cynanchifolia*.
 Corolla-tube more than 1 in. long 31. *T. armipotens*.
- Leaves rounded or subcordate, below.
- Flowers on long peduncles 32. *T. fragrans*.
 Flowers on very short peduncles 33. *T. sessilis*.
- †††† Lobes of the stigma thin, crumpled.
- Leaves dentate 34. *T. chrysops*.
 Leaves palmatipartite 35. *T. geraniifolia*.
- **THUNBERGIOPSIS—Stigma funnel-shaped; calyx truncate;
herbs, usually erect.
- Leaves stalked; stem more or less hairy.
- Leaves more or less ovate.
- Leaves hastate.
- Peduncles attaining $4\frac{3}{4}$ in. in length 36. *T. Mechowii*.
 Peduncles $1\frac{1}{4}$ in. long 37. *T. stuhlmanniana*.
- Leaves cordate.
- Leaves glabrous or with sparsely scattered hairs.
- Bracteoles $\frac{1}{2}$ in. long 38. *T. cordata*.
 Bracteoles nearly 1 in. long 39. *T. togoensis*.
 Leaves pilose on both surfaces.

One anther-lobe of the ventral stamens alone spurred.	
Bracteoles very acute	40. <i>T. mollis</i> .
Bracteoles obtuse or subacute	41. <i>T. mellinocaulis</i> .
Each anther lobe spurred.	
Petioles upwards of 2 in. long	42. <i>T. petersiana</i> .
Petioles less than 1 in. long	43. <i>T. usambarica</i> .
Leaves narrowly lanceolate	44. <i>T. Schweinfurthii</i> .
<i>Leaves sessile; stem usually glabrous.</i>	
Leaves hastate	45. <i>T. lathyroides</i> .
<i>Leaves ovate, obovate, or more or less lanceolate.</i>	
Leaves covered with a thick felt of white hairs	46. <i>T. angolensis</i> .
Leaves hairy on both surfaces, obovate to linear-lanceolate	47. <i>T. oblongifolia</i> .
Leaves hairy below, narrowly lanceolate	48. <i>T. parvifolia</i> .
<i>Leaves glabrous or rarely with few hairs on the margin, more or less cordate at the base.</i>	
Leaves 4 in. long	49. <i>T. lancifolia</i> .
<i>Leaves 2½ in. long or less.</i>	
<i>Leaves oblong.</i>	
Bracts scabrid	50. <i>T. hyalina</i> .
Bracts hirsute	51. <i>T. cerinthoides</i> .
Leaves lanceolate	52. <i>T. gentianoides</i> .
<i>Leaves linear.</i>	
Leaves 1½–3 in. long	53. <i>T. stellaroides</i> .
Leaves 9 in. long	54. <i>T. longifolia</i> .

1. **T. rufescens**, *Lindau in Engl. Jahrb.* xvii. 96. A shrub about 20 ft. high; the young branches clad with rust-coloured hairs. Leaves elliptic, abruptly prolonged into an acumination above, entire, when young with scattered rust-brown hairs, 6 in. long, 2½ in. wide; petioles 1 in. long, more or less clad with rust-brown hairs. Flowers on peduncles of 1½ in. in length; bracteoles rather firm, elliptic, rounded above, covered densely with short rust-brown hair outside, nearly glabrous within. Calyx-teeth short. Corolla-tube 2 in. long, not, as in its allies, strongly constricted towards the base, where outside is a belt of stiff hairs; lobes ¾ in. long. Anthers acute above, with a crest of bristly hairs below and a few scattered hairs above. Stigma with 2 nearly equal lips.

Upper Guinea. Cameroons: primitive forest between Barombi-ba-Mbu and Kake, *Preuss*, 432!

2. **T. vogeliana**, *Benth. in Hook. Niger Flora*, 476. Shrub 8–15 ft. high. Stems woody, when young quadrangular and with a few hairs at the nodes. Leaves ovate or lanceolate-elliptic, acuminate, acute at the base, up to 8 in. long, 2–3½ in. broad, glabrous; petioles about ½ in. long. Flowers 3 or 4 together on small-leaved axillary branches, or solitary; peduncles glabrous, ½–¾ in. long; bracteoles broadly ovate, thick, rust-coloured, 7–10 lin. long and 5–8 broad, obtuse or mucronate, glabrous. Calyx-teeth many, long. Corolla-tube straight, white, 1¼–1¾ in. long, clad with very small hairs; lobes ½ in. long, violet. Anthers mucronate above, rounded and very unequal below, with bristly hairs at the base and softer ones above. Stigma with two lips, nearly equal in length, the uppermost inrolled. Capsule glabrous, 1¼ in. long, the fertile part not abruptly narrowed into the acute beak.—*T. kame-*

runensis, Lindau in Engl. Jahrb. xvii. 97. *Meyenia vogeliana*, Benth. in Bot. Mag. t. 5389.

Upper Guinea. Cameroons: Victoria, *Kalbreyer*, 15! by the Elephant Lake near Barombi, *Preuss*, 387! Fernando Po, in open spaces, *Mann*, 557! 558! *Vogel*, 147! *Rotchen*, 147!

3. **T. longisepala**, *Rendle in Journ. Bot.* 1896, 129. Stem woody. Leaves small, cordate, $1\frac{1}{2}$ in. long and broad, sometimes apiculate, glabrous; petioles about 7 lin. long. Flowers on peduncles exceeding the leaves; bracteoles firm, glabrous, ovate-oblong, 5-nerved, $\frac{3}{4}$ in. long, scarcely $\frac{1}{2}$ in. broad. Calyx with a very short cup; segments $\frac{1}{2}$ in. long, narrow, hispidulous. Corolla-tube narrow, $1\frac{1}{2}$ in. long and 1–2 lin. in diam.; lobes only 4 lin. long. Anthers with a spinous crest at the base of each lobe prolonged upwards in a line of hairs. Stigma 2-lipped, the upper lip slightly the larger.

Nile Land. British East Africa: Taita plains, *Scott-Elliot*, 6166!

Mozamb. Dist. German East Africa: Kilimanjaro, 5000 ft., *Johnston*!

4. **T. malangana**, *Lindau in Engl. Jahrb.* xvii. 95. Shrub with the younger branches pubescent. Leaves ovate or ovate-lanceolate, glabrous except the midrib, entire or irregularly toothed, shortly acuminate above, obtuse below, reaching $5\frac{1}{2}$ in. in length and $2\frac{1}{4}$ in. broad; petioles stout. Flowers solitary on short peduncles; bracteoles nearly 1 in. long, thin, glabrous, rounded above. Calyx-teeth long, unequal, fringed with white hairs. Corolla-tube 2 in. long; lobes 1 in. long, lilac. Anthers mucronate above, rounded below and with a spiny crest prolonged upwards by a row of hairs, the anther-lobes very unequal. Stigma 2-lipped, the lower lip broad; style hairy above.

Lower Guinea. Angola: Malange, in shady and damp valleys, *Buchner*!

5. **T. adenocalyx**, *Radlkf. in Abhandl. Naturw. Ver. Bremen*, viii. 431. Shrub with erect hirsute branches. Leaves elliptic-lanceolate, or the lower more or less rhomboidal, $3\frac{1}{4}$ – $4\frac{3}{4}$ in. long, $1\frac{1}{2}$ –2 in. wide, acuminate, acute below, undulate, with hairs along the veins on both sides and also scabrid with white scales below; petiole $2\frac{1}{2}$ in. long with a stipule-like gland on each side at the base. Flowers on peduncles $\frac{3}{4}$ in. long; bracteoles ovate, 1 in. long, thin, glabrous. Calyx deeply divided into linear subulate scaly lobes. Corolla-tube $1\frac{3}{4}$ –2 in. long, glandular; lobes blue. Anthers apiculate, with a spiny crest below and hairs along the margin. Stigma 2-lipped.

Lower Guinea. Angola: Malange, *Mechow*.

Perhaps only a variety of *T. affinis*. No specimen seen.

6. **T. affinis**, *S. Moore in Journ. Bot.* 1880, 5. Stem woody, 6–7 ft. high, quadrangular when young, glabrous; axillary buds covered with rust-brown hairs. Leaves ovate, acuminate, acute below, $4\frac{1}{2}$ in. long and $1\frac{3}{4}$ in. broad, slightly crisped at the margin, glabrous on short petioles of $\frac{3}{4}$ in. in length, short stipule-like thorns being present at the base. Flowers solitary on short glabrous peduncles; bracteoles ovate, membranous, acute, $1\frac{1}{4}$ in. long and 7 lin. broad, glabrous. Calyx-lobes long, narrow, dotted over with small white scales. Corolla-tube yellow, $1\frac{3}{4}$ in.

long, nearly straight, sparingly hairy outside; lobes violet, 8 lin. long. Anthers $2\frac{1}{2}$ lin. long, very unequal below and with a bristly crest prolonged upwards in a row of soft hairs, acute above. Stigma 2-lipped, the lower lip $1\frac{1}{2}$ lin. long, the upper 2 lin. long and inrolled. Capsule 1 in. long.—S. Moore, Journ. Bot. 1880, 194; Lindau in Engl. Pfl. Ost-Afr. C. 366.

Nile Land. British East Africa: Mombasa, *Hildebrandt*, 2004B! Niamniam: Naporruporru, near Aboo Sammat's Seriba, *Schweinfurth*, 3233!

Lower Guinea. Angola: Golungo Alto; near Calolo and Capopa, *Welwitsch*, 5181! Casabella, *Welwitsch*, 5154! Lombe, in primitive forest, *Welwitsch*, 5109! and without precise locality, *Welwitsch*, 5113! one hundred miles from Ambriz, *Monteiro*!

Mozamb. Dist. Zanzibar, *Kirk*! German East Africa, *Kirk*!

Var. *pulvinata*, S. Moore in Journ. Bot. 1880, 6. Leaves firmer, and usually smaller and mucronate; nerves more prominent. Bracteoles usually shorter, often hairy on the margin, and beset with small white scales. As the stem becomes woody very hairy and large buds develop in the axils of the leaves. Fruit glabrous, 1 in. long. Seeds very slightly reticulated.—Bot. Mag. t. 6975; Oliv. in Trans. Linn. Soc. ser. 2, ii. 345. *T. Holstii*, Lindau in Engl. Jahrb. xvii. 95.

Nile Land. Somaliland: Adda Galla, *James & Thrupp*! Golis Range, at Darra Surry, *Miss Cole*! *Mrs. Lort-Phillips*! British East Africa: Mbuyuni, *Scott-Elliot*, 6182! Ukamba; Kitui, *Hildebrandt*, 2749! Mount Maungu, 2000 ft., *Johnston*! Ribe to Galla country, *Wakefield*! Kinani, *Gregory*!

Mozamb. Dist. German East Africa: Usambara; Uмба Valley, *Smith*! Duga, in scrub, *Holst*, 3203! Kumusha Valley, *Holst*, 543 (ex *Lindau*).

7. **T. erecta**, *T. Anders. in Journ. Linn. Soc.* vii. 18. Shrub 6–8 ft. high; stems quadrangular when young, glabrous except at the nodes. Leaves ovate, on short petioles, acute at the base, acuminate above, with usually a blunt tooth (rarely 2) on each margin towards the upper part, glabrous on both surfaces, $1\frac{1}{2}$ – $2\frac{1}{2}$ in. long, $\frac{3}{4}$ –1 in. broad; occasionally short stipule-like thorns at the base of the petiole. Flowers on peduncles $\frac{3}{4}$ – $1\frac{1}{4}$ in. long; bracteoles very thin, white, obtuse above, $\frac{3}{4}$ in. long. Calyx-teeth 5–9, linear. Corolla-tube $1\frac{1}{2}$ in. long; lobes $\frac{3}{4}$ in. long, purple. Anthers with a spiny crest below and above it a row of soft hairs, their bases very unequal. Stigma with the lower lip rather broad.—*T. Anders. in Journ. Agri.-Hort. Soc. India, N.S.* i. 266; *Meyenia erecta*, *Benth. in Hook. Niger Flora*, 476; *Bot. Mag.* t. 5013.

Upper Guinea. Sierra Leone: Sherboro Island, *Scott-Elliot*, 5856! Gold Coast: Cape Coast Castle, *Vogel*, 14! 83! Lagos, *Millen*, 190!

Schweinfurth's 3545, from Monbuttu, may be this species. The figure cited above is not quite accurate as regards the stamen.

8. **T. crispa**, *Burkill*. Shrub with glabrous branches, but the axillary buds covered with red hairs. Leaves ovate to lanceolate, acute below, shortly acuminate above, with the margins crisped, glabrous on both surfaces, the veins closely reticulated, 4 in. long and $1\frac{1}{2}$ in. wide; petioles $\frac{1}{4}$ in. long. Flowers on long peduncles, $2\frac{1}{2}$ in. long, glabrous; bracteoles thin, blunt, 7–8 lin. long. Calyx segments narrow. Corolla-tube $1\frac{1}{4}$ in. long; lobes $\frac{1}{2}$ in. long, purple. Anthers with crests bearing rather weak bristles at the base, the base very unequal. Stigma with the lower lip rather broad.

Mozamb. Dist. British Central Africa: Zambesiland, *Kirk*! Nyasaand; Manganja Hills, *Waller*! Shire Highlands, *Buchanan*, 27! and without precise locality, *Buchanan*, 866! 1156! 1173!

9. **T. hookeriana**, *Lindau in Engl. Jahrb. xvii. Beibl. 41, 38.* A shrub of 2–3 ft., with slender quadrangular branches, glabrous. Leaves on very short petioles, lanceolate or trapezoid-lanceolate, somewhat acute, entire or with a large tooth on each margin, 3-nerved, $1\frac{1}{2}$ –3 in. long, $\frac{1}{2}$ – $\frac{3}{4}$ in. broad, glabrous on both surfaces, darker above. Flowers two together from the axil of a leaf, on short peduncles; bracteoles $\frac{1}{3}$ in. long, oblong, somewhat acute, green. Calyx-teeth short, obtuse. Corolla-tube $1\frac{1}{4}$ in. long; lobes violet-blue, retuse. Stamens hairy at their insertion; anthers with a very short spur at the base of each lobe, glabrous. Stigma with 2 short lips.—*T. Kirkii*, Hook. f. Bot. Mag. t. 6677, not *T. kirkiana*, T. Anders.

Nile Land. British East Africa: Mombasa, *Wakefield!*

Mozamb. Dist. Zanzibar, cultivated specimen, *Kirk!*

10. **T. annua**, *Hochst. ex Nees in DC. Prod. xi. 55.* A weak herb, branching from the root. Stems with long white hairs when young. Leaves sessile, narrow, oblong-lanceolate, tapering to an acute base, obtuse or rounded above, with scattered hairs along the veins of the lower surface, 4 in. long and $\frac{3}{4}$ in. broad. Flowers on short peduncles; bracteoles ovate, strongly keeled and pilose along the keel, 5–7-nerved. Calyx-teeth rather short. Corolla-tube scarcely longer than the bracteoles, 8 lin. long, rather narrow; lobes $1\frac{1}{2}$ lin. long. Anthers with 2 fine spurs, one at the base of each lobe, and hairy at the base; lobes nearly equal. Stigma with two broad lips, the upper slightly the longer. Capsule thin-walled, pubescent; the fertile part orbicular; the beak arising from it very abruptly. Seeds smooth.—*Hochst. in Flora 1841, Intell. bl. 43* (name only); *Solms in Schweinf. Beitr. Fl. Aethiop. 113.*

Nile Land. Abyssinia: Goelleb, on the River Tacazze, in damp fields at 4000 ft., *Schimper, 2152!* Cordofan: Mount Arasch-Cool, on the margins of stagnant pools, *Kotschy, 109!* Abu-Gerad, *Cienkowsky* (ex *Solms*); and without precise locality, *Kotschy, 97!*

Var. *Ruspolii*, *Burkill.* More hairy, than the type. Leaves subtruncate at the base, hirsute. Bracteoles hirsute.—*T. Ruspolii*, *Lindau in Ann. Istit. Bot. Roma, vi. 67.*

Nile Land. Somaliland: between Oi and Jaribule, *Riva, 108.*

11. **T. hispida**, *Solms in Schweinf. Beitr. Fl. Aethiop. 113* (not of *Lindau*). Stem erect, hispid, quadrangular. Leaves oblong-elliptic, sessile, hispid with white hairs, about 1 in. long, scarcely $\frac{1}{4}$ in. wide; nerves prominent below. Flowers on peduncles 2–3 lin. long; bracteoles ovate, acuminate. Calyx-teeth many, becoming woody at the maturity of the fruit. Flower unknown. Capsule nearly 1 in. long, glandular. Seeds nearly round, ribbed.

Nile Land. Sennar: near Roseres, *Cienkowsky.*

Owing to the want of flowers the exact position of this species must remain doubtful.

12. **T. paulitschkeana**, *G. v. Beck in Paulitschke, Harar, 459, t. 12.* A climber; stem rather thin, hispid. Leaves sessile, oblong-rhomboid,

rounded or acute above, with a conspicuous tooth on each margin, and also sinuate, hispid on both surfaces, 1-1½ in. long, ½ in. broad. Flowers on peduncles 1½-2 in. long; bracteoles broad, cordate, acute, hispid. Calyx tubular, with 11-12 small teeth. Capsule as that of *T. annua*. Seeds rugose. — Lindau in Ann. Istit. Bot. Roma, vi. 67.

Wile Land. Somaliland: Harar, *Robecchi*, 12.

A species closely allied to *T. annua*, differing in its climbing habit, longer peduncles and rugose seeds.

13. ***T. brewerioides***, *Schweinf.* in *Höbnel*, zum *Rudolph-See* u. *Stefanie-See*, *Sonderabdr.* 6, d' *ex Lindau* in *Engl. Jahrb.* xvii. *Beibl.* 41, 41. A low-lying plant with rather sericeous branches. Leaves sessile, elliptic, imbricate, hairy, 7 lin. long, 4 lin. broad. Flowers solitary towards the apex of the stem. Calyx 12-toothed. Corolla-tube 7 lin. long; open corolla 4 lin. in diam. Anthers acute above, glabrous; lobes spurred below. Stigma 2-lipped. Capsule tomentose with rufous hairs, 7 lin. long. — *Engl. Hochgebirgsfl. Trop. Afr.* 387 (name only).

Wile Land. British East Africa: Ndoro, at the foot of Mount Kenia, 6350 ft., *Höbnel*, 89.

An insufficiently known species, said to be allied to *T. Fischeri*.

14. ***T. sericea***, *Burkill*. Stems short, sericeous, more or less hidden by the leaves, which are slightly longer than the internodes. Leaves ovate or elliptic, sessile, acute above, subcordate or more or less rounded below, clothed with silky hairs on both surfaces, 9 lin. long, 4-5 lin. wide. Flowers on short peduncles, which are 2-3 lin. long; bracteoles closely resembling the leaves, more hairy outside, finely hairy within. Calyx-teeth rather long. Corolla-tube ½ in. long, rather narrow; lobes 4 lin. long, apparently white. Anthers obtuse above, the posterior pair with one spur below, the anterior with two slender spurs one on each lobe; the margins fringed with hairs. Stigma 2-lipped, the upper only slightly exceeding the lower, inrolled.

Wile Land. British East Africa: Nandi, in dry places, *Scott-Elliot*, 6903! *Lykipia*, *Gregory*, 78! *Ukamba*; *Machakos*, *Scott-Elliot*, 6696!

This species and the preceding may possibly prove to be the same; but the anthers of *T. brewerioides* are described as acute above and glabrous, while those of *T. sericea* are obtuse and fringed with hairs. *T. atriplicifolia*, *Drege*, closely resembles it in some of its forms.

15. ***T. Fischeri***, *Engl. Hochgebirgsfl. Trop. Afr.* 387. Stem erect, densely woolly. Leaves sessile, oblong, somewhat acute, densely woolly, firm, 2 in. long, ¾ in. broad. Flowers presumably stalked; bracteoles lanceolate, 7-8 lin. long, 5 lin. broad. Calyx-teeth lanceolate-subulate, somewhat glandular-pilose. Corolla-tube 1 in. long. Anthers with a spur on each lobe and long hairs on the margins. Stigma 2-lipped. Capsule ¾ in. long, densely pilose.

Mozamb. Dist. German East Africa: on the east shore of the Victoria Nyanza, near Igitschu-Kamiana, *Fischer*, 492.

Described as closely resembling *T. angolensis*, but of the section *Euthunbergia*. The description is not sufficient to enable its exact position in the genus to be fixed with certainty.

16. **T. fasciculata**, *Lindau in Engl. Jahrb.* xvii. 97. Stem climbing, sparingly pilose. Leaves cordate acuminate, sinuate-dentate on the margin with scattered short hairs above and on the veins below, 3 in. long, 2 in. broad, those on the main axis on petioles 2–2½ in. long. Flowers two or three together on lateral axes, and more or less enveloped in two sessile cordate leaves; peduncles ¼–½ in. long; bracteoles ovate, rounded above and mucronate, at flowering 10 lin. long, sparingly hairy outside. Calyx-teeth triangular, pubescent. Corolla-tube 1½ in. long; lobes 1 in. long. Anthers spurred above, each with two spurs at the base, and fringed with moniliform hairs. Stigma with two broad unequal lips.

Upper Guinea. Cameroons: Buea, *Preuss*, 987!

Specimens of this have been distributed under a different MS. name.

17. **T. huillensis**, *S. Moore in Journ. Bot.* 1880, 194. Stem slender, strigose. Leaves oblong to oblong-lanceolate, rounded and mucronate or obtuse above, truncate or hastate below, strigose on both surfaces, 1–2 in. long, ¾ in. broad; petioles ¼ in. long. Flowers on peduncles 2 in. long; bracteoles lanceolate-ovate, acute above, strigose outside, ¾ in. long. Calyx-teeth long, strigose. Corolla-tube nearly 1 in. long; lobes short, pale blue. Anthers obtuse above, slightly hairy below, each lobe with a spur at the base. Stigma 2-lipped, the lower rounded.—*Engl. Hochgebirgsfl. Trop. Afr.* 387.

Lower Guinea. Angola: Huilla; Morro de Monino, in grass, *Welwitsch*, 5025!

18. **T. hirsuta**, *T. Anders. in Journ. Linn. Soc.* vii. 20. Stem moderately stout, pilose. Leaves broadly ovate, rounded below, obtuse above, covered with stiff hairs on both sides, with one or two teeth on each margin, 1½ in. long, 1 in. broad; petioles 2–3 lin. long. Flowers on pilose peduncles, which attain 3 in. in length; bracteoles cordate, obtuse above, hairy outside like the leaves, glabrous within. Calyx-teeth fairly long, pilose. Corolla-tube 1 in. long; lobes 8 lin. long. Anthers obtuse above, rather sparingly hairy below and with a spur to each lobe. Stigma with the lower lip shorter than the upper and nearly orbicular.—*Lindau in Ann. Istit. Bot. Roma*, vi. 67.

Nile Land. Abyssinia, *Plowden!* Somaliland: between Jaribule and Her, 6800 ft., *Riva*, 71 (ex *Lindau*).

19. **T. Gibsoni**, *S. Moore in Journ. Bot.* 1894, 131. Stem and leaves unknown, the latter said to be ovate. Flowers on pubescent peduncles 3 in. long; bracteoles large, ovate, very shortly acuminate, covered outside with short, rather stiff hairs, puberulous within, at flowering 1½ in. long, 10 lin. broad. Calyx-teeth fairly long. Corolla-tube 1¾ in. long; lobes ¾ in. long, retuse, orange-yellow with a waxy bloom. Anthers obtuse at the apex, with a curved spur at the base of each lobe, pubescent. Stigma with two broad obovate lips.

Nile Land. British East Africa: Mau, in a damp spot at 8200 ft., *Gibson!*

It is probably safe to place this species very near to *T. alata* and *T. Erythrææ*. All that was collected consists of two flowers with their peduncles, which are preserved in the British Museum.

20. **T. alata**, *Boj. ex Sims, Bot. Mag. t. 2591*. Stem moderately thin, climbing, pilose. Leaves ovate, sagittate or hastate, shortly acuminate, pubescent below, and to a less extent above, $2\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. broad, entire or with a few small teeth on the margin; petiole $1\frac{1}{2}$ in. long, winged in the type. Flowers on peduncles 2 in. long; bracteoles ovate, subcordate below, obtuse, sometimes apiculate, pubescent on both sides, keeled, at flowering 8–12 lin. long. Calyx-teeth narrow, hairy. Corolla-tube $\frac{3}{4}$ – $1\frac{1}{4}$ lin. long, with scattered white hairs in the deep claret-coloured throat; lobes 6–8 lin. long, usually yellow, more rarely orange, buff or white; occasionally the throat is of the same colour as the lobes of the corolla. Anthers obtuse above, those of the upper pair each with one spur at the base; those of the lower with two spurs; lobes fringed with moniliform hairs. Stigma 2-lipped, the upper lip narrower and exceeding the lower. Capsule $\frac{3}{4}$ in. long, pubescent.—*Hook. Fl. Exot. 177*; *Nees in DC. Prod. xi. 58*; *Lodd. Bot. Cab. t. 1045*; *Klotzsch in Peters' Reise Mossamb. 196*; *Oliv. in Trans. Linn. Soc. xxix. 124*; *Lindau in Engl. Pfl. Ost-Afr. C. 366*; *Höhnel, zum Rudolf-See u. Stefanie-See, Sonderabdr. 6*; *Engl. in Götzen, Durch Afrikas, Sep.-abdr. 4*; *Henriques in Bolet. Soc. Brot. x. 145*; *Dewevre in Comptes-rendus Soc. Bot. Belg. xxxiii. 104*; *T. aurantiaca*, *Paxt. Mag. Bot. vi. 269*; *T. albiflora*, *Gord. in Gard. Chron. 1845, 169*; *Bot. Mag. t. 3512*; *Paxt. Mag. Bot. iii. 23*; *T. Doldsi*, *Hort. ex Paxt. Mag. Bot. xv. 221*; *Fl. Serres, iv. 415*; *T. Fryeri*, *Hort. ex Vilmorin, Fl. Pl. Terre, ed. 1, 876*; *T. Backerii*, *Hort. ex Vilmorin, Fl. Pl. Terre, ed. 2, 919*; *T. reticulata*, *A. Rich. Tent. Fl. Abyss. ii. 139 (partly)*; *T. mangunjensis*, *T. Anders. ex Lindau in Engl. Jahrb. xvii. 92*; *Endomelas alata*, *Rabn. Fl. Tellur. iv. 67*.

Upper Guinea. Sierra Leone: Regent, *Scott-Elliot, 4141a!* near Freetown. *Walcritch, 5207!* *Johnston, 59!*

Nile Land. Abyssinia: Shire District, *Quartin-Dillon & Petit, 176!* British East Africa: Niamniam: at Nabambisso River, *Schweinfurth, 2985!* Unyoro, *Speke & Grant, 534!* Ukamba: Kitui, *Hildebrandt, 2734!* Taveta, 2500 ft., *Höhnel*.

Lower Guinea. Island of St. Thomas: Rio da Ouro Roca, 800 ft., *Moller (ex Henriques)*. German South-west Africa: Damaraland (ex *Lindau*).

Mozamb. Dist. Zanzibar, *Bojer!* Kavala Island in Lake Tanganyika, *Carson, 31!* German East Africa: Kirunga, 6500 ft., *Götzen, 53, 61 (ex Engler)*. Portuguese East Africa: Mozambique, *Kirk!* Quilimane, *Kirk!* British Central Africa: Nyasaland: Nyika Plateau, 6000–7000 ft., *Whyte, 123!* Masuka Plateau, 6500–7000 ft., *Whyte!* Nyika mountains, 4000–6000 ft., *Whyte!* Fort Hill, *Whyte!* Zomba, *Whyte!* Manganja Hills, 3000 ft., *Kirk!* between Shibisa (Chikwawa) and Tahinmuze, 2000–4000 ft., *Kirk!* and without precise locality, *Buchanan, 1093!* Ngamiland; Kwebe, *Lugard, 114!*

Var. *viridata*, *Burkill*. Leaves, stems and bracteoles softly pubescent. Petioles not or scarcely winged.—*T. fuscata*, *T. Anders. ex Lindau in Engl. Jahrb. xvii. Beibl. 41, 40*, *Oliv. in Trans. Linn. Soc. ser. 2, ii. 345*; *Engl. Hochgebirgsfl. Trop. Afr. 386*. *T. angulata*, *R. Br. (not of Hilsenb. & Boj.) in Salt. Abyss. App. 65 (name only)*; *T. mitisima*, *Stend. Nom. ed. 2, ii. 683 (name only)*; *T. alata*, *S. Moore in Trans. Linn. Soc. ser. 2, iv. 30*.

Nile Land. Abyssinia, *Salt!* British East Africa: Ruwenzori, *Scott-Elliot, 7795!* Kikuyu: Kapte Plateau, 5000–6000 ft., *Thomson!*

Mozamb. Dist. German East Africa: Kilimanjaro: Marangu, 3300–8000 (?) ft., *Meyer, 52, 103 (ex Engler)*, *Folkens, 436!* Kilema, 3800–4200 ft., *Kersten (ex*

Engler) ; without special locality, *Smith!* and at 6000 ft., *Johnston*, 185! British Central Africa : Nyasaland ; Manganja Hills, *Meller!* Shire Highlands, *Buchanan*, 150! Mount Mlanje, *Whyte*.

Var. *reticulata*, Burkill. Leaves not softly pubescent, but with scattered hairs ; petiole not winged. Bracteoles becoming quite glabrous during the ripening of the fruit.—*T. reticulata*, Hochst. in pl. Schimp. Abyss. sect. ii. 758 ; Nees in DC. Prod. xi. 58 ; A. Rich. Tent. Fl. Abyss. ii. 139 (in part) ; Martelli, Fl. Bogos. 64.

Nile Land. Eritrea : Keren, *Beccari*, 225 (ex *Martelli*) ; Damas Valley, 1700 ft., *Schweinfurth & Riva*, 640! Abyssinia : Samen ; Gapdia, in grassy places among shrubs, *Schimper*, 758! Tigre ; Shahagenni, 5000 ft., *Schimper*, 228!

Var. *retinervia*, Burkill. Leaves with the veins on the lower face very prominent and scabrid ; bracteoles apiculate.

Mozamb. Dist. British Central Africa : Nyasaland ; Nyika Plateau, 6000–7000 ft., *Whyte!* between Mpata and the commencement of the Tanganyika Plateau, *Whyte!* Zambesi Land, *Kirk!*

The type is widely introduced into all the warmer parts of the world ; native in Tropical Africa and Natal. Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 292, figures a very different plant as *T. reticulata*.

21. **T. Erythrææ**, *Schweinf. ex Lindau in Engl. Jahrb. xvii. Beibl. 41, 40, and xx. 3.* Stem thin, climbing, hirsute, with rough hairs. Leaves, as in *T. alata*, ovate-hastate, acuminate, hispidulous, with a few teeth on the margin, $1\frac{3}{4}$ in. long, $1\frac{1}{4}$ in. broad ; petiole narrowly winged, hairy. Flowers on long hairy peduncles about $2\frac{1}{2}$ in. long ; bracteoles ovate, nearly $1\frac{1}{2}$ in. long, keeled. Calyx irregularly toothed, finely hairy. Corolla-tube $1\frac{3}{4}$ in. long ; lobes $\frac{3}{4}$ in. long and broad. Anthers acute above, spurred and hairy as in *T. alata*, the upper with one spur, the lower with two. Stigma 2-lipped, the lower lip twice as broad as the upper, deltoid.—Lindau in Ann. Istit. bot. Roma, vi. 67.

Nile Land. Eritrea : Mount Kube, 6000 ft., *Schweinfurth & Riva!* Damas Valley, 2000–3000 ft., *Schweinfurth & Riva!* Ginda, 3000 ft., *Schweinfurth*, 201. Somaliland : Jaribule, in shade, 6800 ft., *Riva*, 89.

It is closely allied to *T. alata*, and in its larger flower resembles *T. Gibsoni*.

22. **T. Gregorii**, *S. Moore in Journ. Bot. 1894, 130.* Stem moderately slender, climbing, covered with tawny, bristly hairs. Leaves broadly ovate, cordate and 5–7-lobed, or hastate, pilose on both surfaces, $1\frac{1}{4}$ – $1\frac{1}{2}$ in. long and 1 – $1\frac{1}{4}$ broad ; petiole $\frac{3}{4}$ in. long, winged. Flowers on long peduncles, which are pilose like the stem and may be 5 in. long ; bracteoles broadly ovate, cordate at the base, covered with stiff, tawny hairs outside, glabrous within. Calyx-teeth acute, pubescent. Corolla-tube 2 in. long ; lobes truncate. Anthers obtuse above, with a spur at the base of each lobe, pubescent. Stigma with two broad lips. Ovary 1 in. long, pubescent.

Nile Land. British East Africa : Ukamba ; Kilungu, *Gregory!* and without special locality, at 5000–6000 ft., *Scott-Elliott*, 6413.

Mozamb. Dist. German East Africa : Ubena Downs, in grass pasture, *Johnson!*

23. **T. Cycnium**, *S. Moore in Journ. Bot. 1880, 194.* An erect plant, the stem sprinkled with weak hairs. Leaves sessile, ovate, rounded below, rather obtuse above, 5–7-nerved, irregularly crenate,

clad with weak hairs on both surfaces, 2 in. long, 1 in. broad. Flowers on very short pubescent peduncles; bracteoles lanceolate, acute, covered with white hairs, at flowering nearly $1\frac{1}{2}$ in. long. Calyx-teeth many, long, narrow, united into a very short tube at the base. Corolla-tube very narrow, $2\frac{1}{2}$ –3 in. long, widening very slightly upwards to the throat, where it is less than $\frac{1}{4}$ in. in diameter; lobes white, $\frac{3}{4}$ in. long. Anthers mucronate above, long and narrow, mucicous below, not hairy. Stigma with two nearly equal lips, the lower indistinctly deltoid. Capsule about 1 in. long, glabrous.

Lower Guinea. Angola: Huilla; Lopollo, in stony thickets, *Welwitsch*, 5009!

This species and the 5 following form a small group in which the corolla-tube widens but little upwards. In its flower *T. Cycnium* for this reason resembles rather that of some species of *Ipomœa*.

24. **T. gigantea**, *Lindau in Ann. Istit. bot. Roma*, vi. 68. Stem glabrous. Leaves ovate-cuneate, somewhat hastate at the base, cuspidate above, entire or irregularly toothed along the margins, glabrous, $1\frac{1}{2}$ – $2\frac{3}{4}$ in. long, $1\frac{1}{4}$ – $2\frac{1}{4}$ in. broad, 5-nerved at the base; petiole $\frac{3}{4}$ – $1\frac{1}{4}$ in. long. Flowers on peduncles $2\frac{1}{4}$ in. long; bracteoles ovate, rather acute, $1\frac{1}{4}$ – $1\frac{3}{4}$ in. long, glabrous, deciduous. Calyx irregularly toothed, glandular-pilose. Corolla puberulous on both surfaces; tube 7 in. long, narrow; lobes 1 in. long, white, obtuse. Anthers acute above, rounded below, pubescent on the margins toward the base. Stigma 2-lipped. Capsule 2 in. long.

Nile Land. Somaliland: Jabijo, by the River Daa, in grass and under trees *Rira*, 428, 1498.

If this species and the following are misplaced here, their affinity may perhaps be with *T. alata*. It is probable that *T. gigantea* will prove to be a form of *T. guerkeana*.

25. **T. guerkeana**, *Lindau in Engl. Pfl. Ost-Afr. C.* 366. Stem climbing, glabrous. Leaves cordate-ovate with a tooth on either margin towards the base, $1\frac{1}{2}$ –4 in. long, $1\frac{1}{2}$ –3 in. broad; petiole $\frac{3}{4}$ – $1\frac{1}{2}$ in. long. Flowers on peduncles $1\frac{1}{2}$ –3 in. long; bracteoles ovate, rather acute, reflexed. Calyx-teeth many, irregular, glandular. Corolla-tube narrow, upwards of 5 in. long, puberulous at first, later glabrous; lobes $\frac{3}{4}$ –1 in. long, white. Anthers acute above and below, puberulous on the margins. Stigma 2-lipped, exserted, the lips unequal.

Nile Land. British East Africa: Nyika country, *Holst*, 2410; Ukamba; Ulu District, *Fischer*, 465.

26. **T. hamata**, *Lindau in Engl. Jahrb.* xx. 2. Stem climbing, rough with stiff hairs. Leaves ovate-hastate or cordate, somewhat acuminate above, with teeth along the margin, scabrid on both surfaces, $3\frac{1}{4}$ in. long, 2 in. broad; petioles 1– $1\frac{1}{4}$ in. long, scabrid. Flowers on scabrid peduncles 1– $1\frac{1}{2}$ in. long; bracteoles lanceolate, long-acuminate, fused for nearly their whole length along their dorsal margins, pilose, at flowering 1 in. long. Calyx pilose below; teeth linear. Corolla-tube $1\frac{1}{2}$ in. long, scarcely widening upwards; lobes $\frac{3}{4}$ in. long, retuse.

Anthers obtuse above, pubescent, each lobe with a spur below. Stigma with 2 very unequal lips, the upper slightly 3-lobed, larger, with acute lateral angles; the lower trifid.

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, in bush, 5000 ft., *Holst*, 9092!

27. **T. kirkiana**, *T. Anders. in Journ. Linn. Soc.* vii. 19. (*Not T. Kirkii*, Hook. f.) Stem erect, 1–1½ ft. high, pilose. Leaves ovate, hastate, 5–7-nerved, pilose, rounded and mucronate at the apex, 3 in. long, 1½ in. broad; petiole about 1 in. long. Flowers on peduncles 2–2½ in. long; bracteoles narrow, lanceolate, very acute, pilose outside. Calyx-teeth narrow, slightly pilose. Corolla-tube rather narrow, 1 in. long, white; lobes ½ in. long, white. Anthers obtuse at the apex, each with two spurs below, pubescent. Stigma 2-lipped; the upper lip truncate above with rounded angles; the lower triangular, acute. Capsule ¾ in. long, pubescent.—S. Moore in *Trans. Linn. Soc.* ser. 2, iv. 29; Lindau in *Engl. Pfl. Ost-Afr.* C. 366.

Mozamb. Dist. Portuguese East Africa: between Unango and Mtonia, *Johnson*! British Central Africa: Urungu; Fwambo, *Carson*, 61! 108! Nyasaland; near Mount Sochi, 3000 ft., *Kirk*! Blantyre, *Buchanan*, 83! Manganja Hills, *Waller*! Mount Mlanje, *Whyte*! Zomba, 2500–3500 ft., *Whyte*! and without precise locality, *Buchanan*, 495! 640!

28. **T. subalata**, *Lindau in Engl. Jahrb.* xvii. *Beibl.* 41, 41, and xx. 3. Stem fairly thin, straggling, pilose. Leaves ovate or nearly round, subcordate below, rounded above, with a few hairs on the midrib only on each side, reaching 2½ in. in length and 2¼ in. breadth; petiole scarcely ¼ in. long, pilose. Flowers on long pilose peduncles, which reach 4 in. in length; bracteoles ovate, obtuse above, cordate at the base, pilose outside, glabrous within. Calyx-teeth very acute, pubescent. Corolla-tube 1 in. long; lobes 7 lin. long. Anthers pubescent, obtuse above; the lower pair with two spurs below, the upper with a spur to the lower lobe, the upper lobe being larger. Stigma, as in *T. kirkiana*, with the lower lip triangular, acute, the upper longer, truncate, and obtuse.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Zomba, 3000 ft., *Whyte*! and without precise locality, *Buchanan*, 238!

29. **T. Hanningtonii**, *Burkill*. Stem slender, with scattered, adpressed hairs. Leaves narrowly elliptical, rounded at both ends, mucronate at the apex, scabrid on both surfaces, 3 in. long, 10 lin. wide, 5-nerved at the base; petioles short, strigose, ¼ in. long. Flowers on peduncles 1¼ in. long; bracteoles lanceolate, 7 lin. long at flowering, with abundant short hairs outside, glabrous within. Calyx-teeth 5, narrow, strigose. Corolla-tube 1 in. long, not widening except near the base; lobes ½ in. long. Anthers mucronate above, hairy, and with a spur to each lobe below. Stigma 2-lipped; the upper lip broad, rounded, with acute angles; the lower triangular, acute above.

Mozamb. Dist. German East Africa: Unyamwezi; Urambo, *Hannington*!

30. **T. cynanchifolia**, *Benth. in Hook. Niger Flora*, 475. Stem slender, climbing, pilose or glabrous. Leaves ovate, sagittate or cordate, and with two angles near the base on each side, entire, or almost so, mucronate at the apex, glabrous or sparingly hairy above, 7-nerved, reaching 3 in. in length and $1\frac{3}{4}$ broad; petiole 1 in. long. Flowers on short peduncles $\frac{3}{4}$ in. long; bracteoles 5–6 lin. long, lanceolate, pilose, acuminate. Calyx short, with about 8 ovate, very hairy teeth. Corolla-tube $\frac{1}{2}$ in. long; lobes $\frac{1}{4}$ in. long, white. Anthers each with 2 spurs at the base, glabrous, mucronate above. Stigma 2-lipped; the lips nearly equal, folded downwards so that the upper envelopes the lower, broad and acutely angled, the upper slightly retuse and mucronate, and also barbellate on the back, the lower deeply bifid. Capsule 7 lin. long, pubescent; seeds rugose.

Upper Guinea. River Quorra (Niger), *Vogel*, 7! Niger Delta; Nun River, *Vogel*, 58! Cameroons: Rio del Rey, *Johnston*! Batanga, in bush, *Bates*, 126!

31. **T. armipotens**, *S. Moore in Journ. Bot.* 1880, 195. Stem moderately thin, decumbent, pilose. Leaves rather firm, lanceolate, hastate or subcordate at the base, acute at the apex, 5-nerved, more or less scabrid, upwards of 2 in. long and 7 lin. broad; petioles $\frac{1}{4}$ in. long. Flowers on pilose peduncles $1\frac{1}{2}$ in. long; bracteoles ovate, at flowering 8 lin. long, 4 lin. broad, scabrid-pilose outside. Calyx-lobes short, deltoid. Corolla-tube 5 lin. long; lobes 2–3 lin. long, blue. Anthers mucronate above, with a spur to each lobe below and slightly hairy. Stigma with 2 equal lips, which are rounded above and acutely angled at the sides. Capsule $\frac{3}{4}$ in. long. Seeds papillose.—*Engl. Hochgebirgsfl. Trop. Afr.* 387.

Lower Guinea. Angola: Huilla; Empalanca, in bush, *Welwitsch*, 5026! Lopolla, *Welwitsch*, 5027!

32. **T. fragrans**, *Roxb. Corom. Pl.* i. 47, t. 67. Stem slender, climbing, sparingly hairy. Leaves ovate, cordate or rounded at the base, acute or acuminate above, hairy when young, 2–3 in. long, $\frac{1}{2}$ – $1\frac{1}{2}$ in. broad; petiole $\frac{1}{2}$ – $1\frac{1}{2}$ in. long. Flowers on peduncles 1–3 in. long; bracteoles falcate-oblong, somewhat acute, hairy. Calyx-teeth rather short, nearly glabrous. Corolla-tube $\frac{3}{4}$ – $1\frac{1}{4}$ in. long; lobes white. Anthers acute above, sagittate but without spurs, glabrous. Stigma with two equal lips. Capsule puberulous (often glabrous in Indian specimens), $\frac{3}{4}$ –1 in. long. Seeds rugose.—*Bot. Mag.* t. 1881; Nees in DC. *Prod.* xi. 57. *T. laevis*, Nees in Wall. *Pl. As. Rar.* iii. 77; Nees in DC. *Prod.* xi. 56. *T. fragrans* var. *laevis*, C. B. Clarke in *Fl. Brit. Ind.* iv. 391. *T. javanica*, Gært. f. *Fruct.* iii. t. 183; Nees in DC. *Prod.* xi. 56. *T. scandens*, Pers. *Syn.* ii. 179. *T. volubilis*, Pers. *Syn.* ii. 179; Nees in DC. *Prod.* xi. 59. *T. angustifolia*, Ham. ex Nees in Wall. *Pl. As. Rar.* iii. 78; Nees in DC. *Prod.* xi. 56. *T. Roxburghia*, Nees in Wall. *Pl. As. Rar.* iii. 78; Nees in DC. *Prod.* xi. 58. *T. subsagittata*, Blanco, *Fl. Fil.* 518. *T. arnhemica*, F. Muell. *Frag. Phyt. Austr.* ix. 73. *Meyenia longiflora*, Benth. ex Hohenack. in *Flora*, 1849, 558.

Upper Guinea. Sierra Leone: near Regent, *Scott-Elliot*, 4141B.

This species most likely is an introduced plant in Africa. It is widely distributed in India, extending to Malaya, and introduced into Australia and Tropical America. The Sierra Leone plant is the variety *lævis*, C. B. Clarke.

33. **T. sessilis**, *Lindau in Engl. Jahrb.* xvii. 96. Stem erect, herbaceous, covered with rough hairs. Leaves sessile, ovate or broadly lanceolate, rounded or very shortly pointed above, rounded or rarely cordate below, covered on both sides with rough hairs, $1\frac{3}{4}$ –2 in. long, 1 – $1\frac{1}{4}$ broad, entire or with few very small teeth on the margin. Flowers solitary or 2–3 together in the axil of a leaf, sessile; bracteoles ovate-lanceolate, acute, rough-hairy, with 3 nerves, the middle one keeled. Calyx-teeth short, glabrous. Corolla-tube 7–9 lin. long; lobes 3–5 lin. long, white. Anthers acute above, shortly spurred at the base of each lobe. Stigma with two nearly equal lips. Capsule 8 lin. long, glabrous; seeds minutely papillose.

Lower Guinea. Angola: Malange, *Mechow*, 367. Huilla; Humpata, *Welwitsch*, 5044!

Mozamb. Dist. Portuguese East Africa: Morambala Mountain, *Scott*! British Central Africa: Nyasaland, *Buchanan*, 745!

The specimen collected by *Welwitsch* has broadly lanceolate leaves; those of the others are ovate.

34. **T. chrysops**, *Hook. in Bot. Mag. t.* 4119. Stems slender, climbing, herbaceous, slightly hairy. Leaves cordate or ovate-cordate, acute or slightly acuminate, 5–7-nerved, with teeth along the margin, 2 in. long, $1\frac{1}{4}$ broad; petiole not winged, nearly as long as the leaf-blade. Flowers on short peduncles; bracteoles ovate, fringed or more or less clad with hairs. Calyx truncate. Corolla-tube yellow, $1\frac{3}{4}$ in. long; lobes large, purple, retuse, $\frac{3}{4}$ in. long. Anthers acute above, hairy below, and with a spur to each lobe. Stigma with two large yellow plaited lobes, not distinctly separated from one another.—*Paxt. Mag.* xi. 221; *Fl. d. Serres*, i. t. 5; *Hooker, Niger Flora*, 475; *Nees in DC. Prod.* xi. 55.

Upper Guinea. Sierra Leone: from the interior, cultivated at Kew, *Whitfield*.

No specimens have been preserved.

The drawings from which the figure in the Botanical Magazine were taken, represent the stigma as bilobed like that of *T. geraniifolia*. This bilobing, not accurately reproduced in the Botanical Magazine, is still more inaccurately represented in the figure in the *Flore des Serres*. This species and the following form a transition to the section *Thunbergiopsis*.

35. **T. geraniifolia**, *Benth. in Hook. Niger Flora*, 475. Stem slender, climbing, pilose. Leaves cordate, palmatifid or palmatipartite, with short, stiff hairs scattered on both surfaces, $1\frac{1}{2}$ in. long, $1\frac{3}{4}$ broad; lobes acute and dentate on the margins; petioles $1\frac{1}{2}$ – $1\frac{3}{4}$ in. long, pilose. Flowers on peduncles about 1 in. long; bracteoles ovate-lanceolate, 1 in. long, pilose outside, glabrous within. Calyx truncate. Corolla-tube $1\frac{1}{2}$ in. long, glabrous; lobes about $\frac{1}{2}$ in. long, deep purple. Anthers spurred above, glabrous, each lobe with a spur at the base. Stigma 2-lipped; lips nearly equal, very delicate, undulate. Pollen spinulose.—*T. Anders. in Journ. Linn. Soc.* vii. 18.

Upper Guinea. Sierra Leone: near Regent, *Scott-Elliot*, 4039! and without precise locality, *Don! Wilford (ex Anderson)*.

36. **T. Mechowii**, *Lindau in Engl. Jahrb.* xvii. 92. Stem thin, sparingly hairy, twining. Leaves hastate, truncate or rounded at the base, $2\frac{1}{4}$ in. long and $1\frac{1}{2}$ broad, mucronulate above, sparingly pilose, 7-nerved; petiole slightly winged. Flowers on peduncles of great length (up to $4\frac{3}{4}$ in.); bracteoles lanceolate, nearly 1 in. long, 5-nerved and reticulated, keeled on the back. Calyx toothed. Corolla-tube 1 in. long; lobes $\frac{1}{2}$ in. long, violet. Anthers with a spur above and spurs below. Stigma funnel-shaped, triangular, barbellate.

Lower Guinea. Angola: Malange, *Mechow*, 334.

37. **T. stuhlmanniana**, *Lindau in Engl. Jahrb.* xvii. 91. Stem quadrangular, herbaceous, sparingly hairy. Leaves hastate, long and sharply pointed above and also in the auricles, thin, entire, both above and below with yellow hairs on the veins and margin, $2\frac{1}{4}$ in. long and $1\frac{1}{4}$ broad; petiole densely clad with yellow hairs above, 1 in. long. Flowers solitary on peduncles $1\frac{1}{4}$ in. long; bracteoles $\frac{3}{4}$ in. long, oblique, lanceolate, 4-5-nerved, reticulated, with hairs on the principal veins. Calyx very small, with 8-10 teeth. Corolla-tube $1\frac{1}{2}$ in. long, yellow; lobes deep violet, 7 lin. long. Stamens with basal hyaline spurs. Ovary somewhat round; stigma funnel-shaped, triangular, barbellate.

South Central. Congo Free State: Butumbi, south of Lake Albert Edward, 5700 ft., *Stuhlmann*, 2181.

38. **T. cordata**, *Lindau in Engl. Pfl. Ost-Afr. C.* 365. Stem herbaceous, minutely puberulous. Leaves ovate-cordate, glabrous or with solitary hairs towards the base, more than 3 in. long and half as wide, with five nerves at the base; petiole about 1 in. long. Flowers on peduncles equalling the petioles; bracteoles about $\frac{1}{2}$ in. long, 3 lin. broad, ovate, acuminate, 3-nerved, with glandular hairs. Calyx slightly lobed. Corolla-tube 1 in. long, with glandular hairs; lobes $\frac{1}{2}$ in. long, bright blue. Anthers spurred above and below, sparsely hairy. Stigma funnel-shaped, triangular, barbellate.—*Lindau in Engl. Jahrb.* xxiv. 310.

Mozamb. Dist. German East Africa: Kilimanjaro: Useri, 6200 ft., *Volkens*, 1968.

39. **T. togoensis**, *Lindau in Engl. Jahrb.* xxii. 112. Stem climbing, glabrous. Leaves large, cordate-ovate, acuminate, glabrous, 5-nerved, 6-7 in. long, 3-4 in. wide; petiole $1\frac{1}{2}$ -3 in. long. Flowers on peduncles 1 in. long; bracteoles ovate, acute or shortly acuminate, nearly 1 in. long, almost glabrous. Calyx lobed. Corolla-tube $1\frac{1}{2}$ in. long; lobes 7 lin. long, blue. Anthers acute above, hairy, the lower with a spur to the base of its lower lobe only. Stigma funnel-shaped, triangular, barbellate.

Upper Guinea. Togoland: Misahöhe, near Aundjowe-Avatime, 2000 ft., *Baumann*, 74!

40. **T. mollis**, *Lindau in Engl. Jahrb.* xvii. *Beibl.* 41, 34, and xx. 2. Stem with a rusty pubescence or sometimes glabrous, sulcate when dry. Leaves ovate, cordate or hastate, $2\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. broad, frequently

with a few large teeth on the margin, more or less strigose on both surfaces; petiole pubescent with rust-brown hairs, about 1 in. long. Flowers on peduncles about as long as the petioles; bracteoles ovate, very acute, 5-nerved, the middle one forming a marked keel. Calyx short, with a sinuate margin. Corolla large, purple above; tube $1\frac{1}{2}$ in. long; lobes $\frac{1}{2}$ in. long, truncated. Anthers mucronate, glabrous, those of the ventral pair of stamens each with a single hook. Stigma triangular, the lateral angles barbellate, dorsal lobe rounded, anterior side truncated with a small mucro. Capsule 1 in. long, velvety outside.

Mozamb. Dist. British Central Africa: Nyasaland; Shire Highlands, at Mudi, *Scott-Elliot*, 8563! and without precise locality, *Buchanan*, 263! 1092! 1339!

41. **T. mellinocaulis**, *Burkill*. Stem covered with yellowish hairs, becoming glabrous when old, sulcate when dry. Leaves ovate-subcordate, occasionally with one small tooth on the margin at each side near the base, acute or shortly acuminate, pubescent below with yellowish hairs, less so above, 3 in. long, 2 in. broad; petiole $\frac{1}{4}$ in. long or less, densely pubescent. Flowers on slender, almost glabrous, peduncles, attaining $1\frac{1}{2}$ in. in length; bracteoles ovate, obtuse or subacute, somewhat pubescent. Calyx short with a sinuate margin, very slightly hairy. Corolla-tube $1\frac{1}{4}$ in. long, glandular outside; lobes rounded, paler in colour than those of *T. mollis*. Anthers mucronate, with a tuft of hairs at the base of each lobe, one anther lobe only of the lower pair spurred at the base. Stigma triangular, the lateral angle barbellate.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Zomba, 4000-6000 ft., *Whyte*!

Closely allied to the preceding species.

42. **T. petersiana**, *Lindau in Engl. Jahrb.* xvii. 89. Stem thin, with scattered hairs, climbing. Leaves on petioles upwards of 2 in. long, cordate or rarely subcordate, long acuminate, with a few large teeth on the margin, 3 in. long, $2\frac{1}{4}$ in. broad, pilose on both sides. Flowers on peduncles about 1 in. long; bracts ovate-lanceolate, acute, hairy, 3-nerved and 3-keeled, reticulated. Calyx very short, truncate or slightly toothed. Corolla large; tube wide, 1 in. long; lips 5 lin. long, violet. Anthers spurred at the apex and also at the base of each lobe with long spurs, not bearded. Stigma funnel-shaped, triangular barbellate.—*T. chrysops*, *Klotzsch* (not of *Hook.*) in *Peters' Mossamb.* 196.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; Boror, *Peters*.

43. **T. usambarica**, *Lindau in Engl. Jahrb.* xvii. 89. Stem thin, almost glabrous, except at the nodes. Leaves ovate-cordate, acuminate, entire or almost so, with scattered white hairs on both sides, 3 in. long, 2 broad; petiole up to 9 lin. in length. Flowers solitary on peduncles about $1\frac{1}{2}$ in. long; bracteoles broadly lanceolate, 7 lin. long, reticulated, with white glandular hairs. Calyx very small, irregularly toothed. Corolla-tube broad, nearly 1 in. long; lobes blue, small.

Stamens with a long mucro above and with short spurs to each lobe. Stigma funnel-shaped, triangular, barbellate. Unripe capsule with very short hairs and a long beak.

Mozamb. Dist. German East Africa: Usambara; upper part of Schi (Mshi?) Mountains, *Holst*, 213!

I have seen a leaf and a young fruit with its bracteoles. The rest of the description is quoted from Engler's *Jahrbücher*.

44. **T. Schweinfurthii**, *S. Moore in Journ. Bot.* 1880, 6. An erect herb. Stem strigose, densely hairy at the nodes, striate when dry. Leaves on short petioles about 2 lin. long, the leaf-blade 3-nerved, narrowly lanceolate, $2\frac{1}{2}$ in. long, 7 lin. broad, shortly mucronate above, narrowed and hastate below, the upper surface strigose, the lower covered with a tawny pubescence. Flowers on peduncles about half as long as the leaves; bracteoles ovate, lanceolate, acute, 5-nerved, white with green reticulations, strigose on the back. Calyx cupular. Corolla $1\frac{1}{4}$ in. long; lobes about 2 lin. long. Stamens mucronate, slightly bearded below, one anther-lobe of the ventral pair with a hook at its base. Stigma triangular, the lateral angles barbellate, the ventral margin scarcely notched, the dorsal angle slightly hairy, its apex rounded.

Nile Land. British East Africa: Jur; near the Seriba of Kurshook Ali, *Schweinfurth*, 1510!

This species is very closely allied to *T. mollis*.

45. **T. lathyroides**, *Burkill*. Stem erect, glabrous, sulcate when dry. Leaves sessile, hastate, entire, mucronate at the apex and also in the auricles, 2 in. long, $\frac{3}{4}$ in. broad, glabrous. Flowers on glabrous peduncles about $1\frac{1}{2}$ in. long; bracteoles lanceolate, blunt, glabrous, 5-nerved. Calyx truncate. Corolla-tube nearly $1\frac{1}{2}$ in. long; lobes about $\frac{1}{2}$ in. long. Anthers of the ventral pair of stamens with a short spur at the base of one lobe, all mucronate above and pilose below. Stigma funnel-shaped, triangular, barbellate.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, at about 5250 ft., *Carson*, 4! *Nutt*! *Scott-Elliot*, 8269!

46. **T. angolensis**, *S. Moore in Journ. Bot.* 1880, 195. Stem erect, covered with a thick felt of white hairs. Leaves obovate, sessile, entire, $1\frac{1}{2}$ in. long, $\frac{3}{4}$ in. broad, covered like the stem with white hairs on both surfaces. Flowers on peduncles about 1 in. long; bracteoles ovate, obtuse, 1 in. long, felted outside, glabrous within. Calyx glabrous; teeth triangular. Corolla-tube $1\frac{1}{4}$ in. long; lobes $\frac{1}{2}$ in. long, purple. Anthers with a long mucro above, rounded below, and the lower pair with a curved spur. Stigma funnel-shaped, triangular, barbellate.

Lower Guinea. Angola: Huilla; between Mumpulla and Humpata, in thickets *Welwitsch*, 5037! between Mumpulla and Nene, *Welwitsch*, 5038!

47. **T. oblongifolia**, *Oliv. in Trans. Linn. Soc.* xxix. 125, t. 123. Stem erect, pilose or glabrescent on the internodes, sulcate when dry. Leaves sessile, obovate or somewhat spatulate, obtuse above, clad on

both surfaces, or at least fringed on the margin, with soft hairs, about 14 lin. long, 4 lin. broad. Flowers on short peduncles; bracteoles lanceolate, rough with short brown hairs. Calyx irregularly toothed. Corolla orange-yellow; tube $1\frac{1}{4}$ in. long; lobes $\frac{1}{2}$ in. long. Anthers with a mucro above, the lower pair with a spur on one lobe, pilose below. Stigma triangular, funnel-shaped, barbellate. Fruit 1 in. long.

Mozamb. Dist. German East Africa: Usagara; Robeho Mountains, 4700 ft., *Speke & Grant!* Lake Tanganyika, *Cameron!* Higher Plateau, North of Lake Nyasa, *Thomson!*

Var. *glaberrima*, Burkill. Glabrous in all its parts, leaves lanceolate or linear-lanceolate.

Mozamb. Dist. German East Africa: between Lake Nyasa and Lake Tanganyika, 6000–8000 ft., *Thomson!* British Central Africa: Urungu; Fwambo, *Carson*, 87!

48. **T. parvifolia**, *Lindau in Engl. Jahrb.* xvii. 90. Stem herbaceous, finely hairy. Leaves sessile, linear-lanceolate, rounded above, up to $2\frac{1}{4}$ in. long and 2 lin. broad, entire, finely hairy below. Flowers on pedicels up to 10 lin. long; bracteoles lanceolate, acute, microscopically hairy outside, 5-nerved, not reticulated, $1\frac{1}{2}$ in. long, $\frac{1}{2}$ in. broad. Calyx very short, truncate, or toothed. Corolla-tube nearly $1\frac{1}{4}$ in. long; lobes $\frac{1}{2}$ in. long, $\frac{3}{4}$ in. wide, deep violet. Anther-lobes blunt, unequal, hairy below. Stigma funnel-shaped, triangular, barbellate.—*Dewèvre in Comptes-rendus Soc. bot. Belge*, xxxiii. 104.

Lower Guinea. Angola: River Quango, *Pogge*, 311, 312.

South Central. Congo Free State: Upper Congo, Katanga, *Cornet*.

49. **T. lancifolia**, *T. Anders. in Journ. Linn. Soc.* vii. 19. Stem erect, 2–3 ft. high (*Bryce*), sulcate when dry, glabrous, except at the nodes. Leaves varying from linear-lanceolate to oblanceolate, narrowing to, or sometimes auriculate at, the base, sessile, acute or obtuse above, glabrous and shining on both surfaces, upwards of 4 in. long. Flowers on pubescent or glabrous peduncles about $\frac{1}{2}$ in. long; bracts ovate, acute, glabrous or pubescent like the peduncle. Calyx-teeth short, irregular. Corolla-tube $1\frac{1}{4}$ in. long; lobes 9 lin. long, deep purple. Anthers with a spur above, hairy below; the ventral pair each with a usually straight spur below. Stigma funnel-shaped, triangular, barbellate or not. Capsule covered with a fine pubescence, $1\frac{1}{4}$ in. long.—*S. Moore in Journ. Bot.* 1880, 195. *Engl. Hochgebirgsfl. Trop. Afr.* 387; *S. Moore in Trans. Linn. Soc. ser. 2, iv.* 30; *Lindau in Engl. Pfl. Ost-Afr. C.* 366; *Dewèvre in Comptes-rendus Soc. bot. Belg.* xxxiii. 104.

Lower Guinea. Angola: Golungo Alto; Izanga, in thickets, *Welwitsch*, 5161! Pungo Andongo; Sobati de Quilombo, on rather dry hillsides, *Welwitsch*, 5110! Malange, *Marques*, 11.

Mozamb. Dist. Kavala Island, in Lake Tanganyika, *Carson!* German East Africa: hills north-east of Lake Tanganyika, *Scott-Elliot*, 8229! between Lake Nyasa and Lake Tanganyika, 6000–8000 ft., *Thomson!* British Central Africa: Nyasaland; Mount Chiradzulu, *Meller!* Magomero, *Meller!* Blantyre, *Scott!* *Buchanan*, 134! Shibisa (Chickwawa) to Tshinmuze, 2000–4000 ft., *Kirk!* Shire Highlands, *Buchanan*, 135! 136! Mount Zomba, *Whyte!* Blantyre, *Descamps (ex Dewèvre)*; Mashonaland; Inyati River, *Bryce!*

Var. *auriculata*, S. Moore in Journ. Bot. 1880, 195. Leaves auricled at the base or more or less cordate.—*T. lancifolia*, var. *pallida*, S. Moore, loc. cit.

Lower Guinea. Angola: Huilla; Lopollo, in sandy thickets, *Welwitsch*, 5011! Monino, in thickets, *Welwitsch*, 5012!

50. **T. hyalina**, *S. Moore in Journ. Bot.* 1880, 195. Stem erect, 1–2½ ft. high, glabrous, striate when dry. Leaves sessile, amplexicaul, oblong, obtuse or acute, glabrous and shining on both surfaces, entire, scabrid on the margins, firm. Flowers solitary, on short peduncles about 5 lin. long; bracteoles oblong-lanceolate, acute, 5-nerved, scabrid. Calyx short, truncate. Corolla glossy purple, very similar to that of *T. lancifolia*; tube orange, and about 1¼ in. long. Anthers with a mucro at the apex, hairy at the base; the lower pair with one lobe spurred at the base. Stigma funnel-shaped, triangular, barbellate.

Lower Guinea. Angola: on rocky hills, near the River Cuanza, *Welwitsch*, 5164!

Certainly very close to *T. lancifolia*; the stamens are not glabrous, as stated in the original description.

51. **T. cerinthoides**, *Radlkf. in Abhandl. naturw. Ver. Bremen*, viii. 434. Stem glabrous except at the nodes, quadrangular, sulcate when dry. Leaves oblong or obovate-elliptic, 2 in. long, ¾ in. wide, obtuse or somewhat acute, cordate at the base, almost sessile, entire, firm, glabrous but for short hairs on the margin. Flowers on peduncles about 7 lin. long; bracteoles ovate-lanceolate, somewhat oblique, 1 in. long, ½ in. wide, acute, 3-nerved, hirsute with glandular hairs outside, glabrous within, except at the tip. Calyx very short, sinuate-dentate. Corolla-tube 1½ in. long, yellow, glandular; lobes violet. Anthers mucronate above, pilose; the inner pair each with one spur. Stigma funnel-shaped, triangular, barbellate.

Lower Guinea. Angola: Malange, *Mechow*, 373.

This species may prove only to be a form of *T. hyalina*, with larger flowers, and somewhat less glabrous. The distinction in the stamens which Radlkofer mentions fails, for *T. hyalina* was incorrectly described in this particular.

52. **T. gentianoides**, *Radlkf. in Abhandl. naturw. Ver. Bremen*, viii. 433. Stem herbaceous, 3–4 ft. high, quadrangular, glabrous, except at the nodes, sulcate when dry. Leaves narrowly lanceolate, about 2½ in. long, ½ in. wide, acuminate above, subcordate below, sessile, glabrous. Flowers on peduncles ¾–1½ in. long; bracteoles obliquely ovate or ovate-lanceolate, 1 in. long, 5 lin. broad, rather acute, 3-nerved. Calyx very short, with a few blunt teeth, puberulous at the base. Corolla-tube 1¼–1½ in. long, somewhat orange, glandular; lobes blue. Anthers all mucronate above and hairy below, the ventral pair with one curved spur each at the base. Stigma funnel-shaped, triangular, barbellate.

Lower Guinea. Angola: Malange, *Mechow*, 195.

53. **T. stellarioides**, *Burkill*. Stem erect, glabrous, sulcate when dry. Leaves linear, sessile, acute or somewhat obtuse, glabrous, 1½ in.

long, 1-1½ lin. broad. Flowers on pubescent peduncles about ¾ in. long; bracteoles ovate, acute, pubescent, 5-nerved and keeled, about ½ in. long when flowering. Calyx-teeth short, minutely pubescent. Corolla-tube ¾ in. long; lobes ¼ in. long. Anthers mucronate above, pilose below; the ventral pair with a short spur below on one lobe. Stigma funnel-shaped, triangular, barbellate.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, *Carson*, 85! 92! 101! Stevenson Road, *Scott-Elliot*, 8298bis!

Var. *graminea*, Burkill. Leaves longer, up to 3 in. in length; bracteoles glabrous.

Mozamb. Dist. British Central Africa: Stevenson Road, 4000-5000 ft., *Scott-Elliot*, 8392!

54. **T. longifolia**, *Lindau in Engl. Jahrb.* xvii. 91. Stem herbaceous, glabrous. Leaves linear, entire, glabrous, 9 in. long, ½ in. wide. Flowers solitary or two together, on short, glabrous peduncles; bracteoles ovate, densely hairy, with four parallel veins, 7 lin. long, 4 lin. broad. Calyx very short, truncate. Corolla-tube 1 in. long; lobes 4 lin. long, deep violet. Anthers hairy below, with a spur above. Ovary long. Stigma funnel-shaped, triangular, barbellate, the posterior angle notched.

Nile Land. British East Africa: Niamniam; north of the River Ibba, *Schweinfurth*, 3965.

3. **ELYTRARIA**, Vahl; Benth. et Hook. f. *Gen. Pl.* ii. 1073.

Calyx 4-partite; segments unequal, the largest sometimes bifid. Corolla small, white or bluish; tube linear; limb 2-lipped; lobes 5, oblong, imbricate in bud. Stamens 2 perfect, attached in the corolla throat; anthers elliptic, acute; cells 2, parallel, with or without a minute spur at the base. Stigma shortly 2-lipped; ovules 6-10 in each cell, superimposed. Capsule ellipsoid, acute. Seeds minute, ovoid, reticulated, minutely papillose, attached at a minute point without retinacula.—Herbs with short stems. Leaves alternate, crowded, sub-radical. Scapes covered by imbricate bracts; spikes close, rigid, simple or divided; bracts spirally imbricate, not opposite; bracteoles smaller than the bracts.—*Tubiflora*, Gmel. *Syst.* 27.

A small genus of about 3 distinct species, one of which is widely spread in Tropical Africa and Asia.

1. **E. crenata**, *Vahl, Enum.* i. 106. Stem 0-5 in., villous or pubescent. Leaves spatulate or oblanceolate, obtuse, rounded or rather acute, entire or sinuate towards the base, sometimes crenate, attenuate below, 2-7 in. long. Scapes several, 2-9 in. high, clothed with small bracts, often branched at base of the spikes. Spikes dense, ½-5 in. long. Bracts ovate, acuminate, ciliate, 2 lin. long. Bracteoles 2, lanceolate, pubescent. Calyx 2 lin. long, scarious; lobes lanceolate, acuminate, the posterior broader. Corolla 3-4 lin. long, white or pale blue. Capsule ovoid, 2 lin. long.—*Klotzsch in Peters' Mossamb.*

Bot. 197; T. Anders. in Journ. Linn. Soc. vii. 20; Nees in DC. Prod. xi. 63; S. Moore in Journ. Bot. 1880, 196. *E. marginata*, Vahl, Enum. i. 108; Beauv. Fl. Owar. ii. 58, t. 93; Nees l.c.; Hook. Niger Flora, 477; Henriques in Bolet. Soc. Brot. x. 146. *E. lyrata*, Vahl, Enum. i. 106. *Justicia acaulis*, Linn. f. Suppl. 84. *Tubiflora acaulis*, O. Kze. Rev. Gen. Pl. 500; Lindau in Engl. Pfl. Ost-Afr. C. 365. *T. squamosa*, Lindau (partly) in Engl. & Prantl, Pflanzenfam. iv. 3B. 289; Durand & Wildeman in Comptes-rendus Soc. bot. Belg. xxxvi. 82; Büttner in Mitth. Deutsch. Schutzgeb. vi. 234.

Upper Guinea. Togoland, Büttner, 173. Lagos: Otto, common in forest-paths, Millen, 24! Oware and Benin, Beauvois. Lower Niger: Onitsa, Barter, 1302! Niger Delta: Grand Bassa, Vogel, 93! Cameroons: Batanga, Bates, 190! Fernando Po, Vogel, 15! Mann, 26!

Nile Land. British East Africa: Niamniam; by the River Yuru, Schweinfurth, ser. iii. 225!

Lower Guinea. Island of St. Thomas, Don! Moller (ex Henriques). Gaboon River. Mann, 1002! Angola: Golungo Alto; Cungulungulo, Welwitsch, 5209! Quibolo Rivulet, Welwitsch, 5210; and without precise locality, Curror!

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; at Tete, Lupata and Sena, Kirk!

A form of the plant with entire acuminate leaves, which taper gradually into the obvious petiole and perhaps have more hairs on the upper surface than usual, occurs throughout the Great Western forest region from Lagos (and perhaps also Togoland) to the Gaboon River, and westward to Niamniam Land. It has been mistaken for the American *E. tridentata*, Vahl, which differs in having obviously keeled narrow sterile bracts, those of *E. crenata* being scarcely, or not at all, keeled and ovate. The form, common in India, with spathulate almost sessile crenate leaves, occurs on the Zambesi. Intermediate forms so unite these two extremes, both in Africa and India, that they cannot be held distinct.

4. **NELSONIA**, R. Br.; Benth. et Hook. f. Gen. Pl. ii. 1073.

Sepals 4, unequal, lanceolate, the larger often bifid. Corolla very small, purplish, rose or white; tube slender; limb 2-lipped; lobes 5, obtuse, patent. Stamens 2, attached above the middle of the tube; anthers 2-celled; their lobes broadly ellipsoid, distinct, more or less divergent, glabrous or ciliate, muticous or minutely spurred. Stigma very shortly 2-lipped; ovules in each cell 8-10. Capsule oblong, acute, bearing seeds from the base, barren upwards. Seeds small, roundly ellipsoid, papillose, attached on minute points without retinacula. A diffuse, softly villous herb. Leaves opposite, elliptic, entire. Spikes ovate or cylindric; bracts ovate, glandular-villous, closely imbricate; bracteoles 0.

A single species, widely diffused through the tropics of both hemispheres, but probably introduced into America.

1. **N. campestris**, R. Br. Prod. 481. Stems short; branches diffuse, decumbent, pubescent or villous. Lower leaves large and long petioled; upper shortly petiolate or subsessile, much smaller, sometimes under $\frac{1}{2}$ in. long, pubescent or canescent. Spikes villous, 1-3 in. long. Bracts broadly ovate, 2-3 lin. long. Calyx $1\frac{1}{2}$ -2 in.

long. Corolla 2-2½ lin. long. Capsule 2-3 lin. long.—Oliv. in Trans. Linn. Soc., xxix. 125. *N. canescens*, Nees in DC. Prod. xi. 67; A. Rich. Tent. Fl. Abyss. ii. 140. *N. tomentosa*, A. Dietr. Sp. Plant. ed. 2, i. 419; T. Anders. in Journ. Linn. Soc. vii. 20; S. Moore, Journ. Bot. 1880, 196. *N. brunelloides*, O. Kze. Rev. Gen. Pl. 493; Lindau in Engl. Pfl. Ost-Afr. C. 365. *N. origanoides*, Roem. & Schult. Syst. i. 173. *Justicia canescens*, Lam. Ill. i. 41. *Acanthodium spicatum*, Acerbi ex Nees in DC. Prod. xi. 67.

Upper Guinea. Senegal, *Boivin*, 416! *Rousillon*, 53! Senegambia, *Heudelot*, 48! Island of St. Mary and Kingdom of Cayor, *Leprieur* (ex *Nees*); Gambia, *Brown-Lester*, 48! Sierra Leone: near Freetown, *Scott-Elliot*, 5905! and without precise locality, *Afzelius*. Ashanti: Assin-Yan-Coomassie, *Cummins*, 191! Lagos, *Millen*, 75! Niger Territory: Nupe, *Barter*, 1159! Fernando Po, *Barter*, 2046! *Mann*, 253!

Nile Land. Abyssinia: Tigre; near Jelajeranne, *Schimper*, 900! 1815! *Quartin-Dillon & Petit*! and without precise locality, *Schimper*, 803! Upper Senaar: Fazokl, *Kotschy*, 484! Sarad Mts., *Lefevre*! Bahr-el-Abiad, *d'Arnaud*! British East Africa: Moru Dist.; Neangara, *Petherick*! Wayo, *Petherick*! Mittuland; Ngama, *Schweinfurth*, 2776! Mvolo, *Schweinfurth*, 2788! Niamniam; Nabambisso River, *Schweinfurth*, 3004! Ugauda, in deep shade, *Scott-Elliot*, 7345! Ruwenzori, *Scott-Elliot*!

Lower Guinea. Corisco Bay, *Mann*, 1869! Gaboon: Munda; Sibange Farm, *Soyaux*, 295! Angola, *Welwitsch*, 5212! 5213! 5215! 5216! 5217!

Mozamb. Dist. German East Africa: Lake Tanganyika, *Cameron*! east shore of Lake Tanganyika, between Karema and Ujiji, *Scott-Elliot*, 8330! Khutu; Mbwiga, 1290 ft., *Speke & Grant*! Portuguese East Africa: Zambesi Delta; between Mambucha and Vicenti, *Scott*! British Central Africa: Nyasaland; Fort Hill, 3500-4000 ft., *Whyte*! Manganja Hills, *Meller*! Shibisa (Chikwawa) to Tshinmuze, 2000-4000 ft., *Kirk*! Zomba, 2500-3500 ft., *Whyte*! and without precise locality, *Buchanan*, 91!

5. SYNNEMA, Benth. in DC. Prodr. x. 538.

Sepals narrow, often unequal. Corolla nearly straight; tube shorter than the calyx; limb long, 2-lipped, twisted to the left in bud; palate transversely plicate-rugose, purple-rose and white. Stamens 2 or 4, the posterior pair being smaller; anther-cells parallel. Ovary narrow; style sparsely hairy. Capsule narrow, with many seeds borne from the very base. Seeds small, ovoid, somewhat compressed, glandular-puberulous or glabrous; retinacula minute, conical, soft, not curved.—Herbs, often viscid, aromatic. Leaves opposite, upper toothed, rarely entire, lower often pinnatifid or pectinate. Flowers in spikes or whorls, or 1-3 together in the axils of the leaves.—*Cardanthera*, Ham. ex Benth. & Hook. f. Gen. Pl. ii. 1074. *Adenosma*, Nees (not of R. Br.) in Wall. Pl. As. Rar. iii. 75; DC. Prod. xi. 67.

A genus of about 10 species, of which two only occur in Africa; the others are Indian.

*PLÆSIANTHERA. Stamens 2 1. *S. africanum*.

**EUSYNNEMA. Stamens 4 2. *S. brevitubum*.

1. ***S. africanum***, O. Kze. Rev. Gen. Pl. 500. Stem branched, 1½-2 ft. high; branches puberulous. Leaves of two forms, the lower stated to be submerged and pinnatifid, the upper sessile, linear-lanceolate,

acute or almost obtuse, puberulous, $\frac{1}{2}$ – $2\frac{1}{4}$ in. long, $1\frac{1}{2}$ –3 lin. broad. Flowers in whorls at the nodes; bracts resembling the leaves, 3–5 lin. long. Calyx 3– $3\frac{1}{2}$ lin. long, 5-partite; lobes subulate-linear, densely glandular-pubescent. Corolla white, 3 lin. long, 2-lipped; lobes linear, oblong. Stamens with slightly broadened filaments. Ovary glabrous.—*Adenosma africana*, T. Anders. in Journ. Linn. Soc. vii. 21. *Cardanthera africana*, Benth. & Hook. f. Gen. Pl. ii. 1075.

Upper Guinea. Niger Territory: Nupe; Jeba, *Barter*, 751!

2. **S. brevitubum**, *Burkill*. Stem pilose, quadrangular, branched. Leaves, at least the upper, narrowly lanceolate, sessile, pilose on both surfaces, entire, 2 in. long and 4 lin. broad. Flowers 6–10, crowded at each node; bracts resembling the leaves, 3–5 lin. long. Calyx-segments 5, acute, free, pilose, the posterior 4 lin. long and $\frac{3}{4}$ lin. broad, the others shorter and narrower. Corolla-tube funnel-shaped, only $1\frac{1}{2}$ lin. long; the upper lip rounded, 1 lin. long; the lower much larger, 4 lin. long, 3-fid and with 6 gland-like marks in pairs near the median line. Stamens 4, their filaments inserted at the top of the tube. Style hairy. Capsule 3 lin. long; seeds many; retinacula short.

Upper Guinea. Gold Coast: Upper Volta; Salaga, *Krause!* Togoland: Krakye, on the River Volta, *Krause!*

This remarkable species has the habit of *Stachys sylvatica*; I can compare the appearance of the curious flowers to nothing better than those of *Orchis Morio*, which in face view the corolla resembles.

6. **HYGROPHILA**, R. Br.; Benth. et Hook. f. Gen. Pl. ii. 1075.

Calyx-segments 5, or 4 by the union of the anterior pair, equal or unequal. Corolla contorted in the bud, bilabiate, the upper lip forming a hood, the lower 3-lobed, usually plicate-rugose at the base. Stamens 4, the posterior usually smaller; filaments of the upper and lower stamen of each side frequently united at the base; anthers muticous, bilocular, lying under the hood. Style filiform; posterior lobe of the stigma extremely minute. Ovary many-ovuled. Capsule linear-oblong or linear, compressed, its valves grooved on the back, 2-celled. Seeds compressed, with hygroscopic hairs; retinacula slender.—Herbs often glandular, erect or spreading, with entire leaves. Inflorescence various.—*Physichilus*, Nees in Hook. Comp. Bot. Mag. ii. 310. *Polyechma*, Hochst. in Flora, 1841, 376. *Asteracantha*, Nees in Wall. Pl. As. Rar. iii. 75. *Nomaphila*, Blume, Bijdr. 804.

A genus distributed through the tropics. All the African species, of which I have seen ripe seeds, show abundantly the hygroscopic hairs; those of the section *Nomaphila* from Asia, however, do not do so to the same extent.

***ASTERACANTHA.** Flowers densely packed at the nodes; with
2–6 spines in each whorl 1. *H. spinosa*.

****EUHYGROPHILA.** Flowers sessile, or almost so, in the axils,
either forming false whorls along the stem or spikes
towards the apex.

Flowers 14–20 at each node.

Leaves 2 in. long; sepals 2 lin. long 2. *H. barbata*.
Leaves $3\frac{1}{2}$ in. long; sepals 3–4 lin. long 3. *H. lutea*.

Flowers 2-10 at each node.

Flowers in false whorls, the internodes obvious between them.

Stems hispid.

Leaves $\frac{3}{4}$ in. broad; stamens equal 4. *H. uliginosa*.

Leaves $\frac{1}{2}$ in. broad; stamens very unequal 5. *H. Teuczii*.

Stems pubescent.

Calyx segments unequal.

Ovary pubescent 6. *H. spiciformis*.

Ovary glabrous.

Calyx segments obtuse 7. *H. odora*.

Calyx segments acute 8. *H. acutisepala*.

Calyx segments equal 9. *H. astera-*

canthoides.

Flowers forming an apparent spike, hiding the internodes.

Calyx divided nearly to the base.

Stems glabrous, leaves slightly ciliate 10. *H. senegalensis*.

Stems and leaves pubescent 11. *H. cœrulea*.

Calyx divided to a little below the middle 12. *H. micrantha*.

***NOMAPHILA. Flowers in small cymes, which are remote from the main axis on long peduncles.

Flowers small, not exceeding $\frac{3}{4}$ in. in length.

Leaves ovate 13. *H. ciliata*.

Leaves linear or linear-lanceolate.

Stem and young leaves pilose 14. *H. pilosa*.

Stem and young leaves scabrid, pubescent, or glabrous.

Leaves $1\frac{1}{2}$ lin. broad.

Corolla scarcely 2 lin. long 15. *H. linearis*.

Corolla 8-9 lin. long 16. *H. gracillima*.

Leaves upwards of $\frac{1}{2}$ in. broad 17. *H. lævis*.

Flowers large, more than 1 in. in length 18. *H. Gigas*.

1. **H. spinosa**, *T. Anders. in Thwaites, Enum. Pl. Zeyl. 225*. Stem stout, erect, hispid or more rarely glabrous. Leaves oblanceolate, without clearly distinct petioles, sparingly hispid on both surfaces, acute above, tapering very gradually to the base, 3-14 in. long, 5-15 lin. broad. Flowers in dense clusters in the axils of the leaves, with stout thorns (usually 6 to each whorl) and many lanceolate or linear bracts. Calyx with the upper sepal 7-9 lin. long, the others shorter and much narrower; the lower pair fused almost or quite to the apex. Corolla-tube about $\frac{1}{2}$ in. long, widening abruptly upwards; lips 6-7 lin. long, mauve. Stamens nearly equal, with the filaments of the lower pair broadened, each attached to the filament of the upper stamen of its side at the base. Capsule about 4 lin. long, linear-oblong, 4-8-seeded.—*T. Anders, Journ. Linn. Soc. vii. 22. H. longifolia, Kurz in Journ. As. Soc. 1870, ii. 78; Engl. Hochgebirgsfl. Trop. Afr. 387. Barleria longifolia, Linn. Amœn. Acad. iv. 320. B. auriculata, Schumacher, Beskr. Pl. Guin. 285. B. macracantha, R. Br. (name only) in Salt., Abyss. App. 64. B. hexacantha, Moris in Mem. Acad. Turin, xxxvi. 200, t. 7. Ruellia longifolia, Roxb. Fl. Ind. iii. 50. Asteracantha longifolia, Nees in Wall. Pl. As. Rar. iii. 90 and in DC. Prod. xi. 247; Wight, Ic. t. 449; Lindau in Engl. Pfl. Ost-Afr. C. 367, and in Ann. Istit. bot. Roma, vi. 68. A. auriculata, Nees in DC. Prod. xi. 248; A. Rich. Tent.*

Fl. Abyss. ii. 146. *A. macrantha*, Hochst. ex A. Rich. Tent. Fl. Abyss. ii. 146.

Upper Guinea. Senegambia, *Heudelot*, 180! Gambia, *Botela!* *Brown-Lester!* Gold Coast: Cape Coast Castle, *Vogel!* *Keating!* Accra, *Don!* and without precise locality, *Thonning* (ex *Schumacher*). Lagos: Abeokuta, *Rowland!* Ogun River, *Millen*, 72! and without precise locality, *Barter*, 20164! Niger Territory: Nupe, *Barter*, 773!

Nile Land. Galabat: Matamma, *Schweinfurth*, 82! Abyssinia: Tigre; near Adowa, *Quartin-Dillon & Petit*, 4! 300! Mount Sholoda, *Schimper*, 343! near Axum, *Schimper*, 1521! Hamedo, 4600 ft., *Schimper*, 557! Mai Terkellem, 6000 ft., *Schimper*, 557! between Keren and Gondar, *Steudner*, 1498 (ex *Engler*). Upper Senaar: Fazokl, *Kotschy*, 496! Fashoda, on the White Nile, *Schweinfurth*, 1097! Kordofan: Mount Arasch-Cool, margins of muddy places, *Kotschy*, 114! between Obeid and Mulbes, *Pfund*, 428! and without precise locality, *Kotschy*, 49! Somaliland: Coromma, in damp shady places, *Riva*, 625 (ex *Lindau*). British East Africa: Bongoland; by the River Sabbi, *Schweinfurth*, 2619! Madi, *Speke & Grant!* Unyoro, *Speke & Grant*, 582! Giriama Mountains, near Mombasa, *Gregory!*

Lower Guinea. Angola: Gambos, *Johnston!* Huilla; Humpata, *Johnston!* German South-west Africa: Amboland; Olukonda, *Schinz*, 9!

Mozamb. Dist. German East Africa: Kilimanjaro; below Majame, 3300 ft., *Volkens*, 1621! Unyamwezi; Mininga, *Speke & Grant*, 66! Portuguese East Africa: Mozambique, *Forbes!* Lower Zambesi; Expedition Island, *Kirk!* between Shupanga and the Shire River, *Stewart!* Mankokwe's village, on the Lower Shire, *Kirk!* British Central Africa: Nyasaland, between Kondowe and Karonga, *Whyte!* Fort Hill, *Whyte!* and without precise locality, *Buchanan*, 805! 1113!

Widely distributed also in India and Ceylon.

2. **H. barbata**, *T. Anders. in Journ. Linn. Soc.* vii. 22. A small plant much branched from the root; branches spreading, pilose when young. Leaves linear-lanceolate, sessile, acute above, tapering very gradually to the base, somewhat hispid, attaining 2 in. in length and 2 lin. in breadth. Flowers in dense axillary whorls; bracts linear-lanceolate, not exceeding the calyces, hispid. Calyx-segments linear, hispid, 2 lin. long, the posterior a little longer than the others. Corolla-tube about 1 lin. long; upper lip beaked, hairy, the beak being fringed with long hairs, lower 3-fid. Stamens of 2 lengths; filaments not broadened. Capsule 2-3 lin. long, about 8-seeded.—*Physichilus barbatus*, *Nees in DC. Prod.* xi. 82.

Upper Guinea. Senegambia, by the River Casamanze, *Heudelot*, 573! Sierra Leone: Samu; near Ruka, on a sandy plateau, *Scott-Elliot*, 4329! between forty-five and seventy miles north-east of Sierra Leone, *Garrett!*

3. **H. lutea**, *T. Anders. in Journ. Linn. Soc.* vii. 22. Erect plant with long internodes and few leaves; stems hispid. Leaves linear-lanceolate, sessile, hispid on both surfaces, obtuse above, $3\frac{1}{2}$ in. long and 4 lin. broad. Flowers in few, densely aggregated whorls; bracts linear-lanceolate or linear, hispid, about 5 lin. long. Calyx-segments linear, hispid, 3-4 lin. long; posterior slightly exceeding the others. Corolla bright yellow, small.

Upper Guinea. Lower Niger: Onitsa, *Barter*, 1163!

A species distinct in its round whorls of flowers, white with the hairs of the calyx and bracts, but described from rather imperfect material.

4. **H. uliginosa**, *S. Mocre in Journ. Bot.* 1880, 197. Stem erect, unbranched, with few leaves, somewhat hispid below, becoming more so

above. Leaves broadly lanceolate, or in the upper part of the stem linear-lanceolate, with scattered rough hairs on both surfaces, sessile or very shortly petiolate, entire, $2\frac{1}{2}$ –3 in. long and $\frac{3}{4}$ in. broad. Flowers whorled, 4–12 at a node; bracts lanceolate. Calyx-segments linear, acute, pubescent, nearly equal. Corolla-tube 5 lin. long; lips about 4 lin. long, purple, pubescent outside. Stamens equal. Capsule 7 lin. long.

Lower Guinea. Angola: Pungo Andongo; Lombe River and near Bumba, in swamps, *Welwitsch*, 5106!

5. **H. Teuczii**, *Lindau in Engl. Jahrb.* xx. 7. Stem quadrangular, hispid. Leaves narrowly lanceolate, petiolate, rough with white hairs along the veins on both sides, $2\frac{3}{4}$ in. long and $\frac{1}{2}$ in. wide. Flowers solitary or few together in the axils of the leaves; bracts lanceolate, hairy, $\frac{1}{2}$ in. long. Calyx-segments 5, equal, rather shorter than the bracts, hairy. Corolla-tube 7 lin. long, hairy on both surfaces; lips 4–5 lin. long, the middle lobe of the lower lip emarginate. Stamens very unequal, those of either side of the flower united at the base. Style hairy. Ovary hairy, becoming glabrous after the fall of the corolla, 10–12-ovuled.

Lower Guinea. Angola: Malange, in swamps, *Mechow*, 375.

6. **H. spiciformis**, *Lindau in Engl. Jahrb.* xx. 5. Stem quadrangular, hirsute with spreading white hairs. Leaves oblong-lanceolate, narrowed to both ends, entire, very shortly stalked, pubescent on both surfaces, $2\frac{3}{4}$ in. long and $\frac{3}{4}$ in. wide. Flowers in small whorls, about 6 to each node; bracts narrowly oblanceolate, ciliate along the margins, and with shorter glandular hairs on the surfaces. Calyx-segments linear, about 5 lin. long, the posterior slightly longer and broader, glandular. Corolla-tube 4 lin. long, pubescent outside; lips 4–5 lin. long, the lower deeply divided. Stamens unequal; filaments of the lower pair broadened, and united at the base to the upper pair. Ovary pubescent.—*Lindau in Ann. Istit. bot. Roma*, vi. 68.

Nile Land. Abyssinia: Gondar, *Steudner*, 1523. Somaliland: River Dana near Aloi, *Riva*, 517.

Mozamb. Dist. East Africa: without locality, *Fischer*, 479! German East Africa: Ugogo; Massweyo, *Stuhlmann*, 333, Uyanzi; Pungusi, *Stuhlmann*, 424, Muhale stream, *Stuhlmann*, 461.

A species very nearly allied to *H. odora*.

7. **H. odora**, *T. Anders. in Journ. Linn. Soc.* vii. 22. Stem erect, pubescent. Leaves lanceolate, or in the upper part of the stem linear-lanceolate, sessile or shortly petiolate, entire, somewhat acute above, pubescent on both surfaces, 3 in. long and nearly 1 in. broad. Flowers whorled 4–12 at a node; bracts linear-lanceolate, pubescent. Calyx-segments linear, obtuse, pubescent, 4 lin. long, $\frac{1}{2}$ lin. broad, the posterior longer and twice as broad. Corolla-tube 4 lin. long; lips 4–5 lin. long, pink, pubescent outside. Stamens nearly equal; filaments of the lower pair not broadened, united each at the base to that of the upper stamen

of its side. Style hairy. Ovary glabrous, 12–16-ovuled.—*Polyechma odorum*, Nees in DC. Prod. xi. 83.

Upper Guinea. Senegambia: Fonta d'Hiallon, *Heudelot*, 12 (ex *Nees*), and without precise locality, *Heudelot*, 807! Sierra Leone: near Mofari, on the River Scarcies, *Scott-Elliot*, 4723!

8. **H. acutisepala**, *Burkill*. Stem erect, quadrangular, pubescent. Leaves lanceolate, petiolate, scabrid-pubescent on both surfaces, obtuse below, acute above, 2 in. long and 7–8 lin. broad; petioles of the lower leaves 3 lin. long. Flowers usually 6 to each node; bracts oblanceolate, pubescent. Calyx-segments linear-setaceous, pubescent, 5 lin. long, the posterior a very little longer than the others. Corolla-tube 5–6 lin. long, glabrous; lips 5 lin. long, pubescent outside, the lower 3-fid. Stamens unequal; the filaments of the upper and lower stamen of either side of the flower united at the base. Style hairy. Ovary glabrous, about 20-ovuled. Capsule nearly $\frac{1}{2}$ in. long, glabrous.

Nile Land. Without locality, *Petherick*!

9. **H. asteracanthoides**, *Lindau in Engl. Jahrb.* xx. 6. Stem quadrangular, pubescent when young especially at the nodes. Leaves lanceolate, acute, sessile, tapering slightly to the base, pubescent, $2\frac{3}{4}$ in. long, 7–8 lin. broad. Flowers in small whorls, usually 6 to each node; bracts lanceolate, pubescent. Calyx-segments equal, 5–6 lin. long, pubescent. Corolla-tube 5 lin. long, hairy outside; lips 5–6 lin. long, hairy, the lower 3-fid. Stamens of either side of the flower united at the base. Ovary glabrous, or with a few glandular hairs. Capsule nearly $\frac{1}{2}$ in. long, 12-seeded.

Nile Land. Erytraea: Osmara, 7500 ft., *Schweinfurth & Riva*, 2106! Abyssinia: between Keren and Gondar, *Steudner*, 1498, Tigramme, *Rohlf & Stecker*.

10. **H. senegalensis**, *T. Anders. in Journ. Linn. Soc.* vii. 22. Stems erect, quadrangular, glabrous, fully branched. Leaves linear, sessile, entire, acute at the apex and tapering slightly to the base, $1-1\frac{3}{4}$ in. long and 1–2 lin. broad, glabrous, or the uppermost sparingly ciliate. Flowers in short spikes at the ends of the branches, 2 at each node; bracts linear, ciliate. Calyx-segments linear-subulate, equal, ciliate. Corolla-tube 3 lin. long; lips 3 lin. long, the lower with 3 large teeth. Stamens almost equal; filaments of the upper and lower of each side united at the base, all slender. Style hairy. Ovary glabrous; seeds numerous.—*Physichilus senegalensis*, Nees in DC. Prod. xi. 81.

Upper Guinea. Sahara, *Guillemin*! Senegal, *Roger*, 32! *Richard*! Senegambia, *Heudelot*, 139! Gambia, *Brown-Lester*, 12!

11. **H. cærulea**, *T. Anders. in Journ. Linn. Soc.* vii. 22. Stems much branched from the base, obscurely angled, pubescent. Leaves narrowly obovate, sessile, pilose, 7–10 lin. long, 2–4 lin. broad. Flowers in short terminal spikes, often very small on the lateral branches; bracts linear, scarcely equalling the calyx, ciliated. Calyx-segments 3–4 lin. long, almost filiform, ciliate, the posterior slightly longer and

broader. Corolla-tube 4 lin. long; lips 3–4 lin. long, slightly hairy outside. Stamens unequal; filaments of the lower longer pair broadened, slightly hairy. Style hairy. Capsule 4 lin. long, many-seeded.—*Polyechma cæruleum*, Hochst. in Flora, 1841, 377; Nees in DC. Prod. xi. 82.

Nile Land. Kordofan: Gebel el Glet, *Pfund*, 98! Om Cherene, *Pfund*, 156! White Nile: near Mount Mussa, *Kotschy*, 310! at El-Ehs, *Schweinfurth*, 970! Bahr-el-Abiad, *d'Arnaud* (ex *Nees*).

12. **H. micrantha**, *T. Anders. in Journ. Linn. Soc. vii. 22.* Spreading plant, much branched; stems hispid with spreading hairs. Upper leaves oblong, obtuse, sessile, 1 in. or so long, entire. Flowers in whorls at the nodes, the one half of the whorl (*i.e.* the small inflorescence from the axil of one leaf) 1–few-flowered, the other half 3–several-flowered; bracts oblong-lanceolate, obtuse, petiolate, equalling the calyx; bracteoles small, subulate. Calyx only divided into equal segments to a little below the middle, hirsute. Corolla white, slightly exceeding the calyx; lower lip not rugose-plicate. Capsule 16–20-seeded.—*Polyechma micranthum*, Nees in DC. Prod. xi. 83.

Upper Guinea. Senegal, *Perrottet*, 477, 32. *Kunth* (ex *Nees*). Senegambia, Dagana, *Leprieur*!

Habit in general of *H. cærulea*; to this species it certainly is most nearly allied.

13. **H. ciliata**, *Burkill.* Stem erect, quadrangular, glabrous. Leaves ovate, sessile, regularly serrate, glabrous, $1\frac{1}{4}$ in. long, $\frac{1}{2}$ in. wide, with 10–12 veins arising from each side of the midrib. Inflorescences 1–3-flowered cymes arising singly from the nodes. Calyx-lobes linear, fringed with hairs along the margins; dorsal lobe exceeding the others, $3\frac{1}{2}$ lin. long. Corolla pubescent outside; tube about 3 lin. long; upper lip 2 lin. long; lower a little longer. Stamens nearly equal; filaments of the lower pair broad and with a few hairs. Ovary pubescent, with 35–40 ovules.—*Nomaphila ciliata*, *T. Anders. in Journ. Linn. Soc. vii. 21.*

Lower Guinea. Congo, *Smith*, 13!

14. **H. pilosa**, *Burkill.* Stems rather slender, obscurely angled, somewhat pilose. Leaves linear-lanceolate, sessile, entire, tapering to both ends, pilose when young, 2 in. long and $\frac{1}{4}$ in. wide. Flowers solitary, or two together, borne on rather long peduncles, a pair of which arise from each node. Calyx-segments pilose, the upper linear-lanceolate, 4 lin. long; the others linear, 3 lin. long. Corolla slightly pilose outside; tube 3 lin. long; upper lip $2\frac{1}{2}$ lin. long; lower a little longer and marked with orange spots. Stamens nearly equal; filaments of the lower pair broad, almost glabrous. Ovary pubescent, with about 20 ovules.

Mozamb. Dist. British Central Africa: Nyasaland; Fort Hill, 3500–4000 ft., *Whyte*! North Zambesia; Batoka Highlands, 3000 ft., *Kirk*!

15. **H. linearis**, *Burkill.* Stem weak, ascending, about 18 in. long, rooting at the base, glabrous. Leaves linear, sessile, glabrous, entire,

acute at the apex, $\frac{3}{4}$ in. long, 1–1½ lin. wide. Inflorescences of 1–2-flowered cymes arising singly from the upper nodes. Flowers on pedicels about 1 lin. long. Calyx-teeth linear, acute, nearly equal, glabrous. Corolla scarcely 2 lin. long. Ovary with about 14 ovules.

Lower Guinea. Angola, *Welwitsch*, 5772!

16. **H. gracillima**, *Burkill*. Stem stout, much branched at the base, glabrous, obscurely angled in the thinner branches. Leaves linear-lanceolate, sessile, scabrid on both surfaces, acute or subacute above, rounded below, upwards of 1 in. long, 1½ lin. broad. Flowers solitary or 2 together in small cymes arising singly from the nodes. Calyx-teeth linear, scabrid; the upper 5 lin. long, $\frac{1}{2}$ lin. broad, the others 4 lin. long. Corolla-tube 4–5 lin. long, somewhat pubescent outside; upper lip 3 lin., lower 4 lin. long, with 2 yellow marks on the palate. Stamens nearly equal; filaments of the lower pair sparingly hairy. Ovary pubescent. Capsule somewhat pubescent, 4–5 lin. long, containing 35–40 seeds.—*Nomaphila gracillima*, *Schinz* in *Verhandl. bot. Ver. Brandenburg*, 1889, 196.

Lower Guinea. Amboland: Olukonda, common on moist land and in grass by water, *Schinz*, 7! 8! 18!

17. **H. lævis**, *Lindau* in *Engl. and Prantl, Pflanzenfam.* iv. 3 B, 297. Stem erect, bluntly angled, clad with very short hairs. Leaves narrowly lanceolate, sessile, entire, acute above, somewhat rounded below, when young clad like the stem with very short hairs, becoming glabrous later, 2½ in. long, $\frac{1}{2}$ in. broad. Inflorescences arising as 3–7-flowered cymes for the most part singly at the nodes. Calyx-teeth linear, acute, glandular-pubescent, the posterior nearly $\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. broad, the others 4 lin. long. Corolla pink; tube 3–4 lin. long, pubescent outside. Stamens nearly equal; filaments of the lower pair fringed, especially on the lower side, with short, stiff hairs. Ovary pubescent, with about 10 ovules. Capsule 5 lin. long, glabrous.—*Nomaphila lævis*, *T. Anders.* in *Journ. Linn. Soc.* vii. 21.

Upper Guinea. Senegambia, *Heudelot*, 197! Niger Territory: Nupe, swampy margins of streams, *Barter*, 1139! 1285!

18. **H. Gigas**, *Burkill*. Stem 4–5 ft. high, pubescent, obscurely angled in the upper part. Leaves narrowly lanceolate, entire, tapering to both ends, pubescent, the upper 3½ in. long and $\frac{1}{2}$ in. wide. Flowers on 2–3-flowered cymes arising singly from the nodes. Calyx glandular-pubescent; lobes linear-subulate, 4, or in the dorsal sepal 5 lin., long, arising from a basal cup 1 lin. deep. Corolla pubescent outside; tube 8 lin. long, much dilated above; upper lip 7 lin. long; lower slightly longer and with long hairs on the palate. Stamens with filaments of different length, those of the lower pair hardly broadened, glabrous. Ovary with 12–14 ovules.

Mozamb. Dist. British Central Africa: Fort Young, in a damp district. *Nicholson*!

Perhaps *Brillantaisia didynama*, *Lindau* in *Engl. Jahrb.* xxiv. 313, may be this species. It was collected at Lufiro in Nyasaland by Captain Descamps.

7. **BRILLANTAISIA**, Beauv.; Benth. et. Hook. f. Gen. Pl. ii. 1076.

Calyx 5-partite; segments linear, sometimes spathulate, usually unequal. Corolla 2-lipped, conspicuous; tube comparatively short; upper lip of two petals forming a hood; lower of three petals more or less saccate towards the base. Stamens 2, their anthers protected by the hood of the corolla; ventral pair of stamens represented by staminodes; filaments inserted into the tube of the corolla to which they are connected for some distance. Pollen with longitudinal ribs, sometimes spiny. Stigma projecting beyond the hood; posterior lobe reduced to a very small tooth. Ovary with many ovules. Capsule linear, its valves grooved on the back, 2-celled. Seeds many, flattened; retacula present.—Herbs reaching 10 ft. in height, with large leaves, the upper and often the lower side of which, owing to the presence of crystals, appears as if marked with white scratches. Flowers of various shades of purple.—*Belantheria*, Nees in DC. Prod. xi. 96. *Leucorhaphis*, Nees, l.c. 97.

A genus confined to Tropical Africa and Madagascar, containing 22 species.

*EURYANTHIUM. — Inflorescence a panicle, or in 8 a raceme.

Sepals linear, equal, or nearly so, acute.

Corolla nearly 1 in. long 1. *B. Lamium.*

Corolla nearly 1½ in. long, glandular outside 2. *B. Eminii.*

Sepals linear, obtuse, sometimes spathulate, the posterior a little larger than the others.

Corolla-tube more than half as long as the lips.

All parts hairy 3. *B. pubescens.*

Leaves glabrous.

Panicle with short glandular hairs 4. *B. Soyauxii.*

Panicle glabrous 5. *B. debilis.*

Corolla-tube not half as long as the lips.

Leaves lanceolate or ovate-lanceolate.

Leaves pubescent 6. *B. Nyanzarum.*

Leaves glabrous.

Posterior sepal broadly spathulate 7. *B. cicatricosa.*

Posterior sepal slightly broadened above.

Inflorescence a slender raceme 8. *B. lancifolia.*

Inflorescence a panicle 9. *B. owariensis.*

Leaves ovate, cordate or rounded below.

Petioles firm, usually shorter than the blade of the leaf.

Lips of corolla less than ¾ in. long 10. *B. vogeliana.*

Lips of corolla ¾–1 in. long.

Panicle racemiform 11. *B. nitens.*

Panicle lax, leaves nearly glabrous 12. *B. salviiflora.*

Panicle lax, leaves pubescent 13. *B. leonensis.*

Lips of the corolla about 1½ in. long 14. *B. patula.*

Petioles weak, almost as long as the elliptical blade . 15. *B. schumanniana.*

Sepals linear, the posterior much broader than the others.

Posterior sepal twice as broad as the others 16. *B. Kirungæ.*

Posterior sepal thrice as broad as the others

Corolla-tube short 17. *B. subulugurica.*

Corolla-tube long 18. *B. ulugurica.*

** STENANTHIUM. Inflorescence a spike.

Leaves with scattered hairs 19. *B. madagascariensis*.
Leaves glabrous 20. *B. verruculosa*.

1. **B. Lamium**, *Benth. in Hook. Niger Flora*, 477. Herbaceous, 3–4 ft. high (*Mann*). Stem somewhat pilose. Leaves cordate or cordate-ovate, acuminate, forming a small wing to the upper end of the petiole, pilose on both sides, entire or nearly so; the uppermost sessile. Inflorescence a lax panicle, glandular-pubescent; lower bracts ovate. Calyx-segments equal, acute, rather sparingly clad with glandular hairs. Corolla deep blue; tube $\frac{1}{4}$ in. long, slightly exceeding the calyx-segments; lips 7–8 lin. long. Staminodes densely glandular. Capsule $1\frac{1}{4}$ in. long, glabrous, with about 20 seeds to each valve.—*Leucorhaphis Lamium*, *Nees in DC. Prod.* xi. 97. *Brillantaisia owariensis*, *Hook. (partly)*, *Bot. Mag.* t. 4717, fig. 3; *Engl. in Engl. Jahrb.* vii. 339; *T. Anders. in Journ. Linn. Soc.* vii. 21 (not of Beauv.). *B. Palisotii*, *Lindau in Engl. Jahrb.* xvii. 99; and in *Engl. & Prantl, Pflanzenfam.* iv. 3B. 296, fig. 119 (not typical); *Henriques in Bolet. Soc. Brot.* x. 146.

Upper Guinea. Sierra Leone: Kortright Hill, *Preuss* (ex *Lindau*), and without precise locality, *Afzelius* (ex *Lindau*)! Liberia: Cape Palmas, *Ansell*! Gold Coast, *Burton & Cameron*! Togoland: Misahöhe, *Baumann*, 67! Bismarckburg, *Büttner*, 231 (ex *Lindau*). Lagos: near Otto, *Millen*, 7! Abeokuta, *Irving*! Lower Niger: Onitsa, *Barter*, 103! Niger Delta: Nun River, *Vogel*, 17! Cameroons: Bipinde, *Zenker*, 1104! Rio del Rey, *Johnston*! Mungo, *Buchholz* (ex *Lindau*).

Lower Guinea. Princes Island, *Rattray*! *Mann*, 1142! Island of St. Thomas: Rio de Ouro, Sandade, *Quintas*, 88 (ex *Henriques*), Blublu; Nova Moka, 2800 ft., *Moller* (ex *Henriques*).

South Central. Lunda: Bashilange; Lulua River, *Pogge*, 1123 (ex *Lindau*).

2. **B. Emini**, *Lindau in Engl. Jahrb.* xvii. 103. Stem tall, pilose above. Lower leaves unknown, uppermost cordate, sessile, acuminate, entire, pilose, thin. Inflorescence a loose panicle, glandular. Calyx-teeth acute, nearly equal, glandular. Corolla-tube $\frac{1}{2}$ in. long, with glandular hairs outside; lips violet, 1– $1\frac{1}{2}$ in. long, with glandular hairs outside; teeth of the lower lip small. Staminodes densely glandular. Capsule $1\frac{3}{8}$ in. long, glabrous, with 16 seeds to each cell.

Mozamb. Dist. German East Africa: Karagwe; Bukoba, *Stuhlmann*, 3644! 3995.

It is very doubtfully distinct from *B. Lamium*. The upper leaves of this and *B. Lamium* are very similar; in the loose panicle and long capsules they agree very closely; the only obvious point of difference between them is in the size of the glandular corolla, and it will be granted that this is a very unsatisfactory one. I have only seen a very small fragment.

3. **B. pubescens**, *T. Anders. ex Oliv. in Trans. Linn. Soc.* xxix. 125. A low very aromatic herb. Stem densely covered with long white glandular hairs, pale in colour. Leaves ovate, contracted gradually to both extremities, or the upper ones obtuse at the apex, pilose above, pubescent below, entire, 4 in. long, $1\frac{1}{2}$ in. wide; petiole $\frac{1}{2}$ in. long, pilose. Inflorescence very much branched, like the stem glandular pilose; bracts spathulate. Calyx-segments linear subspathulate, covered with glandular hairs. Corolla-tube narrow, curved in large flowers,

nearly $\frac{1}{2}$ in. long; lips 8–10 lin. long, “brown tinged with lilac” (*Scott*), the lower with some long white hairs, in small flowers the corolla-tube sometimes barely 2 lin. long, the lips 3 lin. long. Staminodes varying in size in proportion to the size of the corolla, sometimes very small. Capsule 5–7 lin. long, sparingly pilose.—*B. anomala*, Lindau in Engl. Pfl. Ost-Afr. C. 366.

Mozamb. Dist. German East Africa: Khutu; Kirengwe, 900 ft., *Speke & Grant!* near the mouth of the Rovuma River, *Kirk!* Portuguese East Africa: Villa Gouveia, *Carvalho* (ex *Lindau*); Zambesi Delta; banks of the River Quaqua (Kwakwa), *Scott!* British Central Africa: Manganja Hills, *Meller!* Shire Valley, *Waller!* Katunga, on the River Shire, *Scott!*

It appears that the flowers most remote from the main axis are smallest, and have the least capsule. On the specimen which served as a basis for the original description there is a difference of 2 lin. in dimension between the fruits near the top and the bottom of the inflorescence. *B. anomala* appears to be a depauperate form, as are the specimens collected at Katunga.

4. **B. Soyauxii**, *Lindau in Engl. Jahrb.* xvii. 101. Stem glabrous. Lower leaves unknown, upper leaves ovate, rounded below and forming a very short wing to the upper part of the petiole, acuminate with triangular blunt teeth on the margin or almost entire, thin, glabrous. Inflorescence a many-flowered panicle, with shortly glandular hairs; bracts lanceolate. Calyx segments glandular, the posterior the longest and broadest. Corolla-tube 4 lin. long; lips 6 lin. long, violet, the lower with 3 short teeth. Staminodes delicate; their sterile anthers with an appendix. Capsule 7 lin. long, with 26–28 seeds to each valve.

Lower Guinea. Gaboon: Munda; Sibange Farm, *Soyaux*, 454.

5. **B. debilis**, *Burkill*. A weak plant growing in wet places. Stem glabrous. Leaves ovate, narrow below, with a short wing, acuminate above, almost entire, glabrous on both sides, $2\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. wide. Inflorescence lax, few-flowered, glabrous; bracts lanceolate. Calyx-segments linear, nearly equal, fringed with glandular hairs. Corolla-tube 5 lin. long; lips 8 lin. long, dark purple, the upper sparingly hairy outside. Staminodes densely covered with short glandular hairs. Style hairy. Ovary 10 lin. long, glabrous, with about 20 seeds to each valve.

Upper Guinea. Cameroons: Efulen, *Bates*, 350!

6. **B. Nyanzarum**, *Burkill*. Stem glabrous below. Leaves ovate, narrowed into the petiole, slightly acuminate above, regularly dentate-serrate on the margins, pubescent on the lower face, less so above, 5 in. long and $2\frac{1}{2}$ in. wide. Inflorescence lax; lateral branches short, very glandular-pubescent; bracts lanceolate, pubescent. Calyx-segments linear, glandular-pubescent; posterior segment the largest, obtuse. Corolla-tube 3 lin. long; lips 1 in. long, the upper slightly pilose outside, the lower with 3 short teeth. Staminodes with a few glandular hairs. Style hairy. Ovary with 14 ovules to each cell.

Nile Land. British East Africa: Kavirondo, riverside, *Scott-Elliot*, 6999!

7. **B. cicatricosa**, *Lindau in Engl. Jahrb.* xx. 4. A shrubby plant with a subglabrous stem. Lower leaves unknown, the upper sessile, ovate, acute, entire, glabrous. Inflorescence a many-flowered loose

panicle, almost glabrous; bracts ovate. Calyx-segments nearly glabrous, the posterior broadly spatulate above. Corolla-tube 5 lin. long; lips nearly 1 in. long, the teeth of the lower about 2 lin. long. Capsule over $1\frac{1}{4}$ in. long, with 16–20 seeds, hairy; retinacula large.

Nile Land. West side of Ruwenzori, 6000 ft., *Stuhlmann*, 2301.

8. **B. lancifolia**, *Lindau in Engl. Jahrb.* xvii. 98. Stem herbaceous, glabrous below. Leaves narrowly lanceolate, 3 in. long and $\frac{1}{2}$ in. wide, glabrous on both surfaces, entire or nearly so. Inflorescence a large raceme, glandular-pubescent. Calyx-segments linear, the uppermost slightly enlarged towards the apex, fringed with glandular hairs. Corolla-tube 4 lin. long; lips 9–11 lin. long, purple, glabrous. Staminodes with a very few glandular hairs. Capsule 10 lin. long, with a few glandular hairs, and 18–24 seeds to each valve.

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1688!

9. **B. owariensis**, *Beauv. Fl. Owar.* ii. 68, t. 100 (not of Hook.) Stem 10–12 ft. high (*Mann*), glabrous. Leaves ovate-lanceolate, acuminate, gradually narrowed into the petiole, 9 in. long, 3 in. wide, glabrous, evenly serrate on the margins. Inflorescence a loosely thyriform panicle, glandular-pubescent; bracts lanceolate, falling off early. Calyx-segments linear, acute. Corolla-tube 4 lin. long; lips 10–11 lin. Staminodes glandular. Ovary pubescent, 20–24-ovuled.—*Belantheria belvisiana*, *Nees in DC. Prod.* xi. 97.

Upper Guinea. Benin: Agathon, *Beauvois*; Cameroons, at 3000 ft., *Mann*, 1959! *Preuss*, 600!

Under this name Lindau has placed specimens which I refer to *B. vogeliana* and to *B. patula*. As his and other authors' views of species differ from mine, it has been necessary to reject any statement which could not be tested, and only in the case of *B. Lumium*—a species which can scarcely be confused—are localities cited on the word of other writers.

10. **B. vogeliana**, *Benth. in Hook. Niger Fl.* 477 (partly). Stem 4–5 ft. high, erect, pale. Leaves varying from elliptic to cordate, the petiole winged in the upper part, sparingly pilose on both sides, at least when young, the margins of the larger leaves coarsely serrate, of the smaller sinuate. Inflorescence a lax panicle, often much branched, glandular-hirsute; bracts ovate to lanceolate. Calyx-segments linear, slightly broadened at the apex, blunt, fringed with long glandular hairs. Corolla varying in size, violet, frequently orange towards the base, tube $1\frac{1}{2}$ – $2\frac{1}{2}$ lin. long; lips 5–8 lin. long. Staminodes somewhat glandular. Capsule 7–8 lin. long, pubescent, with 18–28 seeds to each valve.—*T. Anders. in Journ. Linn. Soc.* vii. 21. *B. Preussii*, *Lindau in Engl. Jahrb.* xvii. 100. *B. Molleri*, *Lindau in Engl. Jahrb.* xvii. 99; *Henriques in Bolet. Soc. Brot.* x. 146. *Leucorhaphis vogeliana*, *Nees in DC. Prod.* xi. 97.

Upper Guinea. Cameroons: Buea, 3200 ft., *Freuss*, 998! Barombi, *Preuss*, 320! Efulen, in open places, *Bates*, 216! Yaunde, *Zenker*, 513! and without precise locality, *Preuss*, 1029! Fernando Po, *Vogel*, 179! *Mann*, 36!

Lower Guinea. Island of St. Thomas: Monte Cafe, Roca, S. Nicolau, 2300 ft., *Moller*, 87; *Don*!

B. Molleri appears to differ from more typical specimens in nothing but the fewer seeds to the capsule.

11. **B. nitens**, *Lindau in Engl. Jahrb.* xvii. 102. Stem reaching 8 ft. in height, glabrous below. Leaves broadly ovate, cordate or abruptly narrowed into the winged petiole, very acuminate above, regularly serrate on the margins, sprinkled with short hairs on both surfaces. Inflorescence a narrow panicle, the lateral branches scarcely 1 in. long, densely covered with long glandular hairs. Calyx-segments linear, the posterior the longest and rather broader towards its apex, glandular-pubescent. Corolla-tube 5 lin. long; lips 1 in. long, the upper pilose outside, purple. Staminodes glandular. Ovary with 14–16 ovules in each cell.

Upper Guinea. Cameroons: Efulen, *Bates*, 435! Yaunde, *Zenker & Staudt*, 520! West of Buea, 6000 ft., *Preuss*, 847!

A well marked species.

12. **B. salviiflora**, *Lindau in Engl. Jahrb.* xvii. 101. Stem glabrous below. Leaves ovate, subcordate or narrowed into the more or less winged petiole, acuminate, with a few hairs on either surface, the margin coarsely, and on the smaller leaves more or less regularly, dentate; the wing of the petiole almost without teeth. Inflorescence a lax panicle, glandular-pubescent. Calyx-segments linear; the posterior the longest and broadest, glandular-pubescent. Corolla-tube 4 lin. long; lips 7–9 lin. long, the upper pilose outside. Staminodes slightly glandular, with an appendix to the anther. Capsule 8 lin. long, pubescent, with 12–14 seeds to each valve.

Upper Guinea. Togoland: Bismarckburg, *Büttner*, 341; Ashanti, Assin-Yan-Coomassie, *Cummins*, 245! Sierra Leone: forty-five to seventy miles north-east from the coast, *Garrett*!

To this species apparently belongs that mentioned by Bowdich (Mission to Ashantee, 374), of which a poor specimen is preserved at the British Museum.

13. **B. leonensis**, *Burkill*. Stem 1–4 ft. high, glabrous below. Leaves broadly ovate, cordate or rounded below, shortly acuminate above, margin regularly serrate, clad on both surfaces with soft white hairs; petiole winged above, and especially while young densely covered with hairs on the upper side. Inflorescence a somewhat close panicle, glandular-pubescent. Calyx-segments linear, glandular-pubescent, the upper longest and somewhat broadened towards the apex. Corolla-tube 4 lin. long; lips 7–10 lin. long, the upper with hairs on the outside, the lower with three short teeth. Staminodes glandular. Capsule 1 in. long, glandular-pubescent, with about 16 seeds to each valve.—*B. owariensis*, *Hook.* (partly), *Bot. Mag.* t. 4717, figs. 1 and 2. *B. Lamium*, *Benth.* in *Hook. Niger Fl.* 477 (partly).

Upper Guinea. Sierra Leone, *Winwood Reade*! on the way to Regent, *Scott-Elliot*, 3990A! and without precise locality, *Don*!

14. **B. patula**, *T. Anders. in Journ. Linn. Soc.* vii. 21. Stem stout, 6–8 ft. in height, 4–6 in. in circumference at the base (*Grant*). Leaves ovate to elliptic, 12 in. long, 8 in. wide, slightly acuminate at the apex, rounded towards the base, and then prolonged downward in broad wings almost or quite to the base of the petiole; margin coarsely serrate;

a few scattered hairs on each surface. Inflorescence a somewhat lax panicle, the branches frequently falsely dichotomous, more or less covered with short glandular hairs; bracts ovate to lanceolate. Calyx-segments linear, obtuse, with glandular hairs. Corolla large; upper lip $1\frac{1}{2}$ in. long, yellow spotted with lilac, pilose on the outside near the apices; lower lip and the tube lilac; tube attaining 7 lin. in length. Staminodes glandular. Capsule 10–11 lin. long, with about 20 seeds to each valve.—*B. alata*, T. Anders. ex Oliv. in Trans. Linn. Soc. xxix. 125; Durand & Wildeman, Comptes-rendus Soc. bot. Belg. xxxvi. 83.

Upper Guinea. Cameroons, *Preuss*, 600!

Nile Land. British East Africa: Uganda and Unyoro, *Speke & Grant*, 583!

Lower Guinea. Gaboon River, *Mann*, 1007! Loango: Bango, *Soyaux*, 118! Congo, *Smith! Burton!* Angola: Golungo Alto, *Welwitsch*, 5150!

Var. *Welwitschii*, Burkill.—Calyx-segments rather broader, less hairy. Corolla an intense blue.—*B. alata*, S. Moore in Journ. Bot. 1880, 197 in part.

Lower Guinea. Angola: Golungo Alto; Quiapoze and Cuango Rivulets, near Sange, *Welwitsch*, 5149! Quibolo, *Welwitsch*, 5182!

15. **B. schumanniana**, *Lindau in Engl. Jahrb.* xvii. 102. Stem glabrous. Leaves broadly ovate, rounded or subcordate at the base, shortly acuminate above, slightly pilose, 4 in. long, 3 in. wide, their margins serrate at the base, sinuate towards the apex; petiole nearly as long as the blade, with a few acute leafy teeth at the apex. Inflorescence somewhat lax, the branches covered with dark glandular hairs; upper bracts linear-lanceolate. Calyx-segments linear, obtuse or subspathulate at the apex, fringed with glandular hairs; posterior segment the longest. Corolla-tube 5 lin. long; lips 10–11 lin. long. Staminodes slightly glandular. Capsule 1 in. long, with about 30 seeds to each valve.

Upper Guinea. Cameroons, *Braun*, 47!

16. **B. Kirungæ**, *Lindau ex Engl. in Götzen, Durch Africa von Ost nach West, Sonderabdr.* 4, 9. Stem tall, the lower part unknown; pilose near the inflorescence. Lower leaves unknown; upper ovate, sessile, cordate at the base, acuminate above, with large regular teeth on the margin, pilose. Inflorescence a panicle, pubescent; bracts lanceolate. Calyx-segments glandular pilose, the posterior a little longer than, and twice as broad as, the others. Corolla-tube 5 lin. long, slightly narrowed above; upper lip of the corolla 10 lin. long, the lower 14, with fairly large triangular teeth. Staminodes clavate, rather long. Ovary with 16–20 ovules, densely pilose; style pilose.

South Central. Congo Free State: Kirunga Volcano, north of Lake Kivu, *Götzen*, 48.

An insufficiently known species.

17. **B. subulugurica**, *Burkill*. Stem glabrous below. Leaves broadly ovate, acute or acuminate, rounded or subcordate below, and prolonged as a wing on the upper half of the petiole, the margin coarsely dentate or serrate, slightly pilose on both surfaces. Inflorescence a

panicle with the flowers somewhat crowded on the ends of the lateral branches (the lowermost 1 in. long), covered with a fine pubescence. Calyx-segments glandular-pubescent, linear, the uppermost slightly longer than, and three times as broad as, the lateral. Corolla-tube 3 lin. long, glabrous outside, not narrowing to the throat; lips 1 in. long, the upper sparingly glandular-pubescent, the lower cleft for a quarter of its length into 3 acute teeth. Stamens and staminodes sparingly hairy below. Capsule $1\frac{1}{2}$ in. long, finely pubescent, each valve with about 12 seeds.

Mozamb. Dist. Portuguese East Africa: Makua Country, Namuli Hills, *Last!*

This species and *B. ulugurica* have in common the broad upper calyx-segment and the large few-seeded capsule. They differ markedly in the length of the corolla-tube.

18. **B. ulugurica**, *Lindau in Engl. Jahrb.* xxii. 112. Stem about 3 ft. high, glabrous below, pilose above. Upper leaves ovate, sessile, coarsely jagged towards the base, glabrous. Inflorescence with the flowers secund on the smaller branches; bracts ovate, sessile. Calyx-segments unequal, the uppermost slightly longer than, and three times as broad as, the lateral, all clad with reddish-brown glandular hairs. Corolla-tube 7 lin. long, narrowing upwards, with glandular hairs outside; lips about $1\frac{1}{4}$ in. long, the lower cleft for one-third of its length into 3 acute teeth. Filaments broadened and hairy towards their insertion. Capsule nearly $1\frac{1}{2}$ in. long, thickly covered with glandular hairs; seeds about 12 to each valve.

Mozamb. Dist. German East Africa: Ukami; Uluguru, *Stuhlmann*, 8850, 9224!

19. **B. madagascariensis**, *T. Anders. ex Lindau in Engl. Jahrb.* xvii. 103. Stem glabrous below, upwards of 8 ft. high. Leaves broadly ovate, acuminate above, and prolonged in a wing down the petiole, with scattered white hairs on either side, nearly entire. Inflorescence a spike; bracts ovate-elliptic, fringed with long hairs. Calyx-segments linear, obtuse, densely covered with glandular hairs. Corolla-tube 5-6 lin. long; lips 8-11 lin. long, the lower very broad (8 lin.), and with three large blunt teeth at the apex, both pilose outside. Staminodes sparingly glandular. Ovary with 8-10 seeds in each cell.—*T. spicata*, *Lindau in Engl. Jahrb.* xx. 4.

Mozamb. Dist. German East Africa: Usambara; Lutindi, *Holst*, 3316! Gonja, *Holst*, 4216! in fields and clearings, and without precise locality, *Buchwald*, 252! Also in Madagascar.

20. **B. verruculosa**, *Lindau in Engl. Jahrb.* xxii. 113. Stem about 2 ft. high. Leaves ovate, acuminate above, and narrowed into the petiole below, glabrous, margins entire or slightly toothed, 4 in. long, 2 in. wide. Inflorescence a spike, hairy; bracts rhomboidal. Calyx-segments linear, with hairs of 2 forms, long and short, glandular. Corolla-tube 5 lin. long, widening upwards; lips 6 lin. long, white, the lower sparingly glandular. Stamens with hairs at their base. Ovary with 8-10 ovules in each cell, with glandular hairs. Capsule unknown.

Upper Guinea. Cameroons: Yaunde, in dry places, *Zenker & Staudt*, 166.

The plant has received its name from the warts on the pollen. It and the above appear to be very similar.

Imperfectly-known Species.

B. hirsuta, T. Anders. in *Journ. Agric. Hort. Soc. India*, N.S. i. 1868, 267.

8. **RUELLIA**, Linn.; Benth, et Hook. f. *Gen. Pl.* ii. 1077.

Calyx (in Tropical African species) divided deeply into five subequal segments. Corolla $\frac{1}{3}$ – $5\frac{1}{2}$ in. long; tube inflated nearly from the base, or linear-cylindric portion 2–3 in. long; not decisively 2-lipped; lobes contorted in bud. Stamens 4, subsimilar; anther-cells 2, not spurred at the base; pollen globose, surface reticulate or honeycombed. Style with one oblong-linear branch, the other suppressed; ovary with 6–16 ovules, glabrous or hairy. Capsule cylindric, perfecting more than 4 seeds. Seeds nearly glabrous on the faces, with much hygroscopic white hair on the margin. Leaves wavy crenate or subentire, not distinctly toothed; not very unequal at the base, nor those of one pair very unequal. Flowers axillary, solitary or in small cymes, not running into strobilate spikes. Bracteoles small or large, but not enclosing the calyx.

Species 200, in all warm regions.

The Tropical African species, with two exceptions, belong so far as known to the subgenus *Dipteracanthus*; these are recognised generically at a glance by the clavate many-seeded capsule; when no fruit is present, the herbarium examples can be usually recognised by the honey-combed pollen; most of the neighbouring genera have ribbed pollen.

* **DIPTERACANTHUS**. Capsule clavate; lower portion solid, subcylindric. Seeds imbricated obliquely all near the top.

Corolla $\frac{3}{4}$ –2 in. long; linear portion of tube less than $\frac{1}{2}$ in. long. Calyx $\frac{1}{4}$ – $\frac{3}{4}$ in. long, teeth usually acute.

Ovary (except tip) glabrous. Calyx $\frac{1}{4}$ – $\frac{1}{3}$ in. long.

Leaves petioled.

Leaves 1– $1\frac{1}{2}$ in. long, ovate, subobtuse 1. *R. patula*.

Leaves 2–3 in. long, elliptic, tip triangular acute 2. *R. prætermissa*.

Leaves sessile.

Leaves 1– $1\frac{1}{2}$ in. long, elliptic, sparsely hispid 3. *R. sudanica*.

Leaves $1\frac{1}{3}$ in. long, oblong, hispid 4. *R. leucoderma*.

Leaves less than $\frac{1}{2}$ in. long, ovate, scaly 5. *R. placoidea*

Ovary (and capsule) hairy nearly or quite to the base.

Calyx $\frac{1}{3}$ – $\frac{2}{3}$ in. long.

Leaves 2–3 in. long, elliptic-lanceolate, hispid 6. *R. prostrata*.

Leaves 2–3 in. long, elliptic, nearly glabrous, lower obtuse 7. *R. gendwana*.

Leaves 2 in. long, $\frac{1}{8}$ in. broad 8. *R. lineari-bracteolata*.

Corolla very long; linear portion of the tube 1–3 in. long.

Calyx-teeth not acute.

Innovations with stellately-tomentose hairs. Corolla-tube $1\frac{1}{2}$ –2 in. long 9. *R. discifolia*.

Plant without stellate hairs.

Corolla-tube subcylindric, inflated only close to the top.

Calyx-segments 5, free nearly to the base.

Leaves $3\frac{1}{2}$ in. long, ovate, acute, base subcordate 10. *R. amabilis*.

Leaves 2 in. long, ovate, subobtus 11. *R. megachlamys*.

Calyx with the 2 anticus segments connate some way up 12. *R. bignoniæflora*.

Corolla-tube upper half greatly inflated 13. *R. Currori*.

** EU-RUELLIA. Capsule oblong-cylindric. Seeds distributed nearly its whole length.

Leaves with long white soft hairs 14. *R. diversifolia*.

Leaves closely densely pubescent 15. *R. Marlothii*.

1. **R. patula**, *Jacq. Misc. Bot.* ii. 358. Small shrub, grey pubescent or sparsely hairy. Leaves from $\frac{1}{2}$ by $\frac{1}{4}$ to $2\frac{1}{2}$ by $1\frac{1}{4}$ in., ovate or elliptic, obtuse or tip depressed-triangular, suddenly narrowed into a petiole $\frac{1}{8}$ –1 in. long. Cymes small, axillary; bracteoles 2 or 3 times the length of the calyx, spathulate-oblong, often petioled. Calyx rarely exceeding $\frac{1}{4}$ in. in length, deeply divided; segments subequal, acute. Corolla up to $1\frac{1}{3}$ in. long, purple-blue or white; tube much inflated, linear-cylindric portion $\frac{1}{4}$ in. long (small examples with corolla $\frac{3}{4}$ in. long and small leaves and capsules are common). Ovary glabrous, glandular close to the style-base. Capsule $\frac{1}{2}$ in. long, clavate.—*Jacq. Ic. Pl. Rar.* i. 12, t. 119; *Lam. Ill.* t. 550; *T. Anders. in Journ. Linn. Soc.* vii. 24; *Oliv. in Trans. Linn. Soc.* xxix. 127; *C. B. Clarke in Hook. f. Fl. Brit. Ind.* iv. 412; *Engl. Hochgebirgsfl. Trop. Afr.* 388; *Lindau in Engl. & Prantl, Pflanzenf.* iv. 3B. 310, fig. 124, E, F, in *Engl. Jahrb.* xviii. t. 1, fig. 24, in *Engl. Pfl. Ost-Afr. C.*, 368, and in *Ann. Istit. bot. Roma* vi. [1896] 70. *R. prostrata*, *Lam. Encycl.* vi. 349 from descript.; *Bedd. Ic. Pl. Ind. Or.* t. 282. *R. matutina*, *Hochst. et Steud. ex Presl, Bot. Bemerk.* 94. *Dipteracanthus patulus*, *Nees in Wall. Pl. Asiat. Rar.* iii. 82 & in *DC. Prod.* xi. 126; *Wight Ic. Pl. Ind. Or.* t. 1505; *Oersted in Vidensk. Meddel. Kjob.* 1854, 180, t. 4, figs. 19–21; *Solms-Laub. in Schweinf. Fl. Æthiop.* 109, 243. *D. matutinus*, *Presl, Bot. Bemerk.* 94.

Upper Guinea. Sierra Leone, *Brass!*

Nile Land. Nubia: near Suakin, *Schweinfurth*, 125! 300! 397! Nubian Coast, *Bent! Schweinfurth*, 367! Eritrea: Massowa, *Hildebrandt*, 725! near Saati, *Schweinfurth & Riva*, 284! 318! Keren, *Steudner*, 1496! Habab, 6000 ft., *Hildebrandt*, 452! 461! Kordofan, *Kotschy*, 119! 159B! *Pfund*, 317! 424! Abyssinia: Salt! *Ehrenberg! Rohlf's & Stecker! Schimper*, 268! Tigré, 6500 ft., *Schimper*, 229! Somaliland: at Adda Galla, Darror, and Harradigit, *James & Thrupp!* Dobar Weni, and Gooban Plain, *Miss E. Cole & Mrs. Lort Phillips!* Ahl Mountains, 3250 ft., *Hildebrandt*, 1403! British East Africa: Madi, *Speke & Grant!* Tana River, *Thomas*, 90! Ukamba, *Hildebrandt*, 2927!

Lower Guinea. Angola: Loanda, *Welwitsch*, 5069! 5121! 5127! 5139! 5186! Elephant Bay, *Curror*, 21!

Mozamb. Dist. Zanzibar, *Kirk! Hildebrandt*, 984! 1833! German East Africa: Tanga, *Holst*, 2075! British Central Africa: Matabeleland, *Elliott!* Ngami-land; Kwebe, *Lugard*, 45! 49! 68!

2. **R. prætermissa**, *Lindau in Engl. Jahrb.* xx. 15. Leaves up to 3 by $1\frac{1}{2}$ in., ovate, tip narrow-triangular subacute, thinly inspersed by cystoliths and a few hairs on both faces; otherwise as *R. patula*.—*Lindau in Engl. & Prantl, Pflanzenf.* iv. 3B. 310.

Nile Land. Jur: Gir, *Schweinfurth*, 2155! Niamniam, *Schweinfurth*, 3754!

This species appears very close to *R. patula*; the more pointed leaves and the absence of grey pubescence give it a different aspect.

3. ***R. sudanica***, *Lindau in Engl. & Prantl, Pflanzenf.* iv. 3B. 310. Petiole 0– $\frac{1}{8}$ in. long. Bracteoles ligulate, hardly spatulate-elliptic; otherwise as *R. patula*.—*Lindau in Engl. Pfl. Ost-Afr. C.* 368. *R. ibbensis*, *Lindau in Engl. Jahrb.* xx. 15, and in *Engl. & Prantl, Pflanzenf.* iv. 3B. 310. *R. patula*, var. *subvillosa*, S. Moore, MS. *Dipteracanthus sudanicus*, *Schweinf. in Verh. Zool.-Bot. Gesell. Wien*, xviii. 679, partly.

Nile Land. Abyssinia (ex *Lindau*). British East Africa: Ukamba; Kitui, *Hildebrandt*, 2727!

Mozamb. Dist. Kilimanjaro: River Sigi, *Volken*, 63! Usambara: Amboni, *Holst*, 2921!

4. ***R. leucoderma***, *Lindau in Engl. Jahrb.* xxiv. 318. Branches white, with many patent simple and gland-tipped hairs. Leaves up to $1\frac{1}{2}$ by $\frac{1}{3}$ in., oblong, subobtuse, hispid, sessile. Bracteoles $\frac{1}{2}$ in. long, linear-oblong. Sepals $\frac{1}{3}$ in. long, nearly free, linear, green, hairy. Corolla $\frac{3}{4}$ in. long. Ovary glabrous, except at tip.

Nile Land. Somaliland: Abdalla, *Keller*, 217!

5. ***R. placoidea***. *Rendle in Journ. Bot.* 1896, 414. Very small herb. Leaves subsessile, ovate, $\frac{1}{3}$ – $\frac{2}{5}$ in. long, with round scales bearing tufts of bristles on both faces. Calyx scarcely $\frac{1}{3}$ in. long, divided half-way down into 5 subequal teeth. Corolla $\frac{3}{4}$ in. long.

Nile Land. Somaliland: Darro Mountains, *Donaldson Smith*!

6. ***R. prostrata***, *T. Anders. in Journ. Linn. Soc.* vii. 24. Leaves up to 3 by $1\frac{1}{3}$ in., elliptic-lanceolate, tip narrow-triangular often subacute. Calyx-teeth $\frac{1}{3}$ – $\frac{1}{2}$ in. long, setaceous. Pollen larger than in *R. patula*, much more deeply honeycombed. Ovary hairy down to the base. Capsule $\frac{3}{4}$ in. long, pubescent all over (till very ripe), otherwise as *R. patula*.—C. B. Clarke in *Hook. f. Fl. Brit. Ind.* iv. 411; *Lindau in Engl. & Prantl, Pflanzenf.* iv. 3B. 310, and in *Engl. Pfl. Ost-Afr. C.* 368. *R. bignoniceflora*, S. Moore in *Journ. Bot.* 1880, 198, partly. *Dipterucanthus prostratus*, *Nees in Wall. Pl. As. Rar.* iii. 81, and in *DC. Prod.* xi. 124.

Nile Land. Abyssinia, *Steudner*, 1506! Somaliland: Goetton, *Miss E. Cole*! British East Africa: Taita, *Hildebrandt*, 2426!

Lower Guinea. Angola: Ambriz, *Monteiro* Loanda, *Welwitsch*, 5063 partly!

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; between Sena and Lupata, *Kirk*! at the foot of Morambala Mountain, *Kirk*! Lower Shire Valley, *Kirk*! British Central Africa: Tanganyika Plateau, *Carson*! Nyasaland: Zomba, *Whyte & McClounie*! Mount Sochi, *Scott-Elliot*, 8548! Shire Highlands, *Buchanan*, 133! and without precise locality, *Buchanan*, 320!

The plant is here called *R. prostrata*, T. Anders., as it is certainly his plant; *R. prostrata*, Lam., is described with small calyx, and was therefore probably *R. patula*, as *Beddome* takes it.

7. **R. gendwana**, *C. B. Clarke*. More glabrous and more obtuse-leaved than *R. prostrata*. Middle stem-leaves orbicular. Ovary hairy except the stalk; 3–5 ovules in each cell. Capsule hairy, entirely as of *R. prostrata*.—*R. sudanica*, Lindau in *Engl. Jahrb.* xx. 15, partly. *Dipteracanthus genduanus*, Schweinf. in *Verh. Zool.-Bot. Gesell. Wien.* xviii. 680.

Nile Land. Gallabat: banks of the River Gendua, *Schweinfurth*, 131! 132!

This species, from its hairy ovary, cannot be united with *R. sudanica*, unless *R. prostrata* be united with *R. patula*. It might, however, be esteemed a var. only of *R. prostrata*.

8. **R. lineari-bracteolata**, *Lindau in Ann. Istit. Bot. Roma* vi. [1896], 70. Small shrub; branches woody, very slender, white. Leaves $2\frac{1}{2}$ by $\frac{1}{8}$ in., linear, with scattered longish white hairs. Flowers solitary; bracteoles 2, $\frac{2}{3}$ by $\frac{1}{12}$ in. Calyx $\frac{1}{3}$ in. long, divided $\frac{2}{3}$ way down; teeth linear, sparsely white-hairy. Corolla 1 in. long. Stamens and pollen of the genus. Ovary with deflexed white hairs to the base; ovules 4 in each cell. Capsule (fide *Lindau*) $\frac{2}{5}$ in. long, shortly stalked, white-hairy, perfecting 4 seeds only.

Nile Land. Somaliland: Harradigit and Darror, *James & Thrupp!* River Ganane, *Riva*, 1152!

9. **R. discifolia**, *Oliv. in Hook. Ic. Pl. t.* 1511. Small shrub; innovations densely white-stellate-hairy. Leaves 1 in. in diam., sub-orbicular, base truncate, with white stellate tomentum disappearing in age; petiole $\frac{3}{4}$ in. long. Flowers solitary; pedicel 0–1 in. long, axillary; bracteoles at top of the pedicel, $\frac{1}{2}$ in. in diam., orbicular, petiolulate. Calyx-lobes 5, subequal, $\frac{1}{2}$ in. long, linear, subobtuse, stellate-white-tomentose. Corolla pink, tube $1\frac{1}{2}$ –2 in. long, about $\frac{1}{10}$ in. in diam. till near top. Stamens and anthers of the genus, pollen honeycombed. Ovary shaggy to the base.—*James*, Unknown Horn Afr. 321, t. 2; *Schweinf. & Volk. Liste Pl. Somalis*, 16.

Nile Land. Somaliland: Adda Galla, *James & Thrupp!* Gooban Plain, *Miss E. Cole!* Ahl Mountains, 7000 ft., *Hildebrandt*, 866A! Ogaden, *Riva*, 273! Jerado, *Keller*, 190!

In the example of *Hildebrandt* the flowers are sessile in the axils.

10. **R. amabilis**, *S. Moore in Journ. Bot.* 1880, 7. Rather thinly hairy with simple (not stellate) hairs. Leaves up to $3\frac{1}{2}$ by $2\frac{1}{2}$ in., ovate, acute, truncate at the base, thin-textured, undulate-margined, petioles 1 – $1\frac{1}{2}$ in. long, slender. Flowers 3–1, distant, on axillary spikes 2–3 in. long, sessile; bracteoles $\frac{1}{3}$ in. long, linear. Calyx-lobes 5, subequal, exceeding $\frac{3}{4}$ in. long, linear-ligulate, subobtuse. Corolla-tube $2\frac{1}{2}$ by $\frac{1}{10}$ in., dilated only at the very top. Stamens, anthers and pollen as of the genus. Ovary covered with discoid glands nearly to the base; ovules 6 in each cell. Capsule 1 in. long, glandular-hairy; seeds many.—*Lindau in Engl. & Prantl, Pflanzenf.* iv. 3B. 309, fig. 124, A, B, and in *Engl. Pfl. Ost-Afr.* C. 368.

Nile Land. British East Africa: Taita; Voi River, *Hildebrandt*, 2480! Tana River, *Thomae*, 21!

11. **R. megachlamys**, *S. Moore in Journ. Bot.* 1894, 134. Branches woody, with scattered simple spreading hairs $\frac{1}{8}$ in. long. Leaves up to 2 by $1\frac{1}{3}$ in., ovate, subobtusate, sparsely hairy, base truncate; petiole $\frac{1}{3}$ in. long. Flowers axillary, solitary, nearly sessile; bracteoles 2, $\frac{2}{3}$ in. long and broad, ovate, base truncate. Calyx $\frac{2}{3}$ in. long, divided nearly to the base; segments nearly equal, linear-ligulate, obtuse, hairy, one a little larger. Corolla $5\frac{1}{2}$ in. long, linear portion of tube $3\frac{3}{4}$ in. long. Stamens 4, similar; anthers $\frac{1}{6}$ in. long, not tailed; pollen strongly reticulate. Capsule (not ripe) $\frac{1}{3}$ in. long, obovoid, glabrous, 10-seeded.—Lindau in *Engl. Pfl. Ost-Afr. C.*, 368.

Nile Land. British East Africa: Ukamba, 5000–6000 ft., *Scott-Elliott*, 6747! Taita Mountains, *Gregory*!

12. **R. bignoniæflora**, *S. Moore in Journ. Bot.* 1880, 198, partly. Hairy, innovations pubescent somewhat viscous. Leaves 2 in. long, ovate, subobtusate. Flowers axillary, solitary; pedicels 1 in. long; bracteoles $\frac{2}{3}$ in. long, ovate, truncate-based, sometimes petioled. Calyx $\frac{3}{4}$ in. long and more, divided nearly to the base; segments 5, subequal, linear-ligulate, obtuse, 2 anterior united $\frac{1}{8}$ in. up, 3 others nearly free. Corolla-tube 4 in. long, linear-cylindric portion of tube $2\frac{1}{2}$ in. long. Pollen globose, honeycombed. Capsule more than $\frac{3}{4}$ in. long, contracted at the base, glabrous, perfecting 6 seeds.—*Dischistocalyx bignoniiflorus*, Lindau in *Engl. & Prantl, Pflanzenf.* iv. 3B. 307.

Lower Guinea. Angola: Preira de Zemba, *Welwitsch*, 5202! Quisendo, *Welwitsch*, 5126! Loanda, 0–1000 ft., *Welwitsch*, 5063! 5130!

This is hardly distinguishable from *R. megachlamys*. The description (except as to the flowers being sometimes sessile) is taken from *S. Moore's* type specimen. Lindau, l.c. 306, attributes to *Dischistocalyx* echinate pollen, but *Welwitsch* 5202 has the honeycombed pollen typical of *Ruellia*; the wrong plant must have been sent Lindau.

13. **R. Currori**, *T. Anders. in Journ. Linn. Soc.* vii. 24. Branch stout, divided, densely tomentose with very short grey-white hairs. Leaves petioled, ovate, entire, shortly softly hairy. Pedicels $\frac{2}{3}$ in. long. Calyx $\frac{1}{2}$ in. long, divided to the base into 5 subequal linear-ligulate segments, with many short soft hairs. Corolla 2 in. long (blue, fide *T. Anderson*); linear-cylindric portion of the tube $\frac{3}{4}$ in. long, upper inflated portion very large. Stamens, anthers and pollen of the genus.—Lindau in *Engl. & Prantl, Pflanzenf.* iv. 3B. 310.

Lower Guinea. Angola: Elephant Bay, *Curror*, 17!

The material is so scanty, and in such poor condition, that I can add little to *Anderson's* description except that the stamens and pollen are as of *Ruellia*. The leaves present are only $\frac{3}{4}$ in. long, but they are on small lateral shoots; the plant probably bears very much larger leaves. The pedicels were probably 2-bracteoled at top, as throughout this group. Corolla as of *R. patula*, but much larger.

14. **R. diversifolia**, *S. Moore in Journ. Bot.* 1880, 198. Branches shrubby, with many soft spreading long white hairs. Leaves $1\frac{1}{2}$ by 1 in., ovate, subentire, base truncate, tip hardly acute, both faces softly hairy. Cymes close, few-flowered, on axillary peduncle-like branches $\frac{1}{4}$ in. long,

softly hairy; bract $\frac{1}{3}$ in. long, ovate; bracteoles $\frac{1}{3}$ in. long, spathulate-oblong. Calyx $\frac{2}{3}$ – $\frac{3}{4}$ in. long, 5-parted nearly to the base, 2-lipped; 2 segments of anticous lip narrow oblong obtuse, middle segment of posticous lip twice as broad, elliptic, two innermost segments linear, all segments nearly equal in length. Corolla exceeding 1 in. long; linear-cylindric portion of the tube nearly $\frac{1}{2}$ in. long; lobes 5, subequal, short, contorted in bud. Stamens, anthers, ovary, style, as of the genus; pollen globose, deeply honeycombed. Ovary glabrous except the tip. Capsule $\frac{1}{2}$ in. long, oblong-cylindric, about 12-seeded; seeds at nearly subequal distances, from the base of the capsule, small, discoid, glabrous on the faces, very shaggy on the margins with hairs that spring out elastically on being wetted.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 5033! 5042!

A remarkable species, differing in habit and character from any other Old World *Ruellia*. Lindau (in Engl. & Prantl, *Pflanzenf.* iv. 3B. 301) doubts as to the genus under which it should be placed.

15. **R. Marlothii**, *Engl. in Engl. Jahrb.* x. 257 and xix. 151. Branches shrubby, 4-angular, pubescent upwards. Leaves 1 by $\frac{2}{3}$ in., ovate, undulate, subobtuse, both faces stellately softly white hairy, petiole $\frac{1}{12}$ – $\frac{1}{6}$ in. long. Inflorescence few-flowered, axillary, with stellate hairs nearly concealed by numerous long simple few-jointed white hairs; bract ovate, small. Calyx $\frac{1}{2}$ in. long, 5-parted nearly to the base, 2-lipped; segments linear, slightly widened at the obtuse tip, middle segment of posticous lip twice as wide, a little longer than the other segments. Corolla 1 in. long, orange (fide *Engler*); tube inflated from near the base, curved; lobes 5, elliptic, subequal. Pistil and stamens of the genus; pollen globose, honeycombed. Capsule $\frac{1}{2}$ by $\frac{1}{12}$ in. parallel-sided, glabrous; 16-seeded from the base.—Lindau in Engl. & Prantl, *Pflanzenf.* iv. 3B. 310.

Lower Guinea. German South-West Africa: Hereroland; Usakos, 3000 ft. *Marloth*, 1434! Dammaraland; Swakop, *Guerich*, 104!

9. **ENDOSIPHON**, Benth.; Benth. et Hook. f. *Gen. Pl.* ii. 1085.

Corolla-tube long, linear-cylindric; upper inflated part linear-cylindric, hardly $\frac{1}{8}$ in. in diam.; anthers included deep in the corolla-tube.—Leaves in often-unequal pairs, oblique and unequal at the base; margin entire. Otherwise as *Ruellia*; inflorescence as in *R. amabilis*, S. Moore, and its allies.

Species 2, endemic in West Tropical Africa.

Calyx-segments $\frac{3}{4}$ –1 in. long; corolla-tube 1–1 $\frac{1}{2}$ in. long . 1. *E. primuloides*.
Calyx segments 1–1 $\frac{1}{4}$ in. long; corolla-tube 2 in. long . 2. *E. obliquus*.

1. **E. primuloides**, Benth. in Benth. & Hook. f. *Gen. Pl.* ii. 1086. Small shrub; stems 1–2 ft. high, nearly simple, with spreading hairs. Leaves up to 3 $\frac{3}{4}$ by 1 $\frac{1}{2}$ in., narrow-elliptic, narrowed at both ends, softly thinly hairy, tip acute, margin entire wavy; cystoliths numerous. slender, prominent; petioles $\frac{1}{8}$ in. long, base of leaf often unequal, one

side subacute, the other rounded lower down the petiole; in the upper pair of leaves one often reduced to $\frac{1}{4}$ –1 in. long. Pedicels 1–1 $\frac{3}{4}$ in. long, solitary, axillary, with spreading hairs; bract 0; bracteoles, 2, subopposite $\frac{1}{6}$ – $\frac{1}{4}$ in. long, linear, placed about $\frac{1}{4}$ in. below the calyx. Calyx $\frac{3}{4}$ –1 in. long, divided almost to the base; segments slightly unequal, linear-ligulate, minutely hairy and hispid with long white spreading hairs. Corolla blue (*G. Mann*); tube 1–1 $\frac{1}{2}$ in. long: limb almost salver-shaped, 1 $\frac{1}{4}$ in. in diam., of 5 subequal roundish lobes contorted in bud. Stamens 4, subequal; anthers long, linear, muticous, glabrous; pollen shallow-honeycombed. Ovary glabrous, 8–12-ovuled.—Lindau in Engl. & Prantl, Pflanzenf. iv. 3B. 308; T. Anders. MS. in herb. Kew (*primulæflorus*).

Upper Guinea, Fernando Po, 1000 ft., *Mann*, 571!

2. ***E. obliquus***, *C. B. Clarke*. Leaves up to 5 by 2 in., rather harsh, cystoliths very large; petals very short, base of leaf very unequal, lower side rounded or subcordate; one leaf of every pair (seen) greatly reduced, $\frac{1}{4}$ – $\frac{3}{4}$ in. long. Pedicels 1 $\frac{1}{4}$ in. long, bracteoles longer than in *E. primuloides* and farther from calyx. Calyx-segments up to 1 $\frac{1}{4}$ in. long. Corolla purple (*Bates*); tube 2 in. long; otherwise as *E. primuloides*.

Lower Guinea. Gaboon Munda; Sibange Farm, *Büttner*, 357! *Soyaux*, 395! Como River, *Bates*, 457!

Further material may show this to be a form of *E. primuloides*.

10. **MELLERA**, *S. Moore* in Journ. Bot. 1879, 225.

Calyx divided nearly to base; segments 5, subequal, linear-oblong. Corolla 1 in. long, divided half-way down, 2-lipped; segments contorted in bud, the middle one of anticus lip much broader, ovate-oblong. Stamens 4, subsimilar; anthers 2, all spurred at the base or (in *M. submutica*) spur nearly or quite wanting; pollen subglobose, longitudinally many-ribbed. Style with one oblong-linear stigmatic arm, the other suppressed; ovary with 4–6 ovules in each cell. Capsule subcylindric, seed-bearing nearly from the base; seeds more than 4 perfected, glabrous on the faces, with many long white hygroscopic hairs on the edges.—Small shrubs. Leaves toothed. Flowers few in the upper axils, running into an apparently bracteated terminal spike. Bracteoles 2, linear-oblong, as long as the calyx.

Species 3, confined to Tropical Africa.

These plants were placed by Bentham next *Paulowilhelmia* and *Mimulopsis*, from which they differ by the 2-lipped corolla with the tube inflated nearly from the base. Because of the 2-lipped corolla, *S. Moore* and *Lindau* place the genus near *Hygrophila*, from which it is remote in habit.

Anther-cells all spurred at the base.

Inflorescence dense	1. <i>M. lobulata</i> .
Lateral cymes of the panicle loose	2. <i>M. nyassana</i> .
Anther-cells nearly muticous at the base	3. <i>M. submutica</i> .

1. ***M. lobulata***, *S. Moore* in Journ. Bot. 1879, 225, t. 203. Hairy. Leaves 2–3 $\frac{1}{2}$ by 1–2 in., lower up to 8 $\frac{1}{2}$ by 4 in., ovate-lanceolate

acuminate, much toothed, sparingly hairy; petioles $\frac{1}{2}$ – $1\frac{1}{2}$ in. long. Inflorescence apparently terminal, up to 4 by $1\frac{1}{2}$ in., very hairy, floral leaves passing upwards into bracts $\frac{3}{4}$ in. long, ovate, nearly sessile. Calyx (in fruit) up to $\frac{3}{4}$ in. long, cystoliths obscure or 0. Corolla hairy, middle lobe of anticous lip $\frac{1}{3}$ by $\frac{1}{5}$ in., transversely marked and with many strong 1-celled down-pointing yellow hairs. Ovary glabrous, with 4 ovules in each cell.—Lindau in Engl. Jahrb. xviii. 63, t. 1, fig. 12, in Engl. & Prantl, Pflanzenf. iv. 3B. 297, and in Engl. Pfl. Ost-Afr. C. 367.

Nile Land. East side of Lake Albert Edward Nyanza, *Scott-Elliot*, 8067!

Mozamb. Dist. German East Africa: Usambara, Umba Valley, *Smith*, Portuguese East Africa: Mozambique (ex *Lindau*); Morambala Mountain, *Waller*! British Central Africa: Nyasaland; Shire Highlands, *Buchanan*, 79! Manganja Hills, at Magomero, *Meller*! Shibisa (Chikwawa) to Tshinmuze, 2000–4000 ft., *Kirk*, and without precise locality, *Buchanan*, 796!

2. **M. nyassana**, *S. Moore* in *Journ. Bot.* 1894, 133. Viscid, with many gland-tipped hairs. Leaves 3 by $1\frac{1}{4}$ in., elliptic, crenate. Inflorescence 6 by 3 in., lax, of lateral compound cymes; flowers mostly $\frac{1}{4}$ in. apart; bracteoles 1– $1\frac{1}{4}$ in. long, linear-spathulate. Sepals $\frac{3}{4}$ –1 in. long, linear-spathulate. Corolla $1\frac{1}{3}$ in. long, mouth of tube nearly $\frac{3}{4}$ in. in diam. Anther-cells long-spurred. Capsule $\frac{3}{4}$ in. long, narrow-oblong, often 12-seeded.—Lindau in Engl. Pfl. Ost-Afr. C. 367.

Mozamb. Dist. British Central Africa: Nyasaland; Fort Hill, 3000–6000 ft., *Whyte*! Lake Nyasa; Lukoma (Likoma Island?), *Bellingham*!

3. **M. submutica**, *C. B. Clarke*. Branches hairy or woolly, finally glabrate. Leaves $3\frac{1}{2}$ by 2 in., ovate, toothed, hairy, base often cordate; petiole 1– $2\frac{1}{2}$ in. long. Cymes axillary, short, dense, crowded, often running into a quasi-terminal panicle, 6 by $1\frac{1}{2}$ in.; bract $\frac{2}{3}$ in. long, obovate; bracteoles nearly $\frac{1}{2}$ in. long, linear-spathulate. Calyx $\frac{1}{2}$ in. long, divided to the base, hairy; lobes subequal, linear, spathulate at the tip. Corolla 1 in. long, blue (*Buchanan*); tube gradually dilated upwards; mouth very oblique, 2-lipped; 2 posticous segments longer, middle anticous segment short, broad, with a few yellow deflexed hairs. Filaments hairy; anthers hardly apiculate at the base (rarely a minute spur is seen); pollen globose, many-ribbed. Ovary glandular-hairy towards the top; 5–6 ovules in each cell; style with one linear branch, the other suppressed.—*Pseudobarleria Lindau*, *Dewèvre* in *Comptes-rendus Soc. bot. Belg.* xxxiii. 104.

Mozamb. Dist. British Central Africa: Nyasaland; Blantyre, *Buchanan*, 103! *Dewèvre*, Mount Chiradzulu, 4000 ft., *Whyte*! Nyika Plateau 4000–7000 ft., *Whyte*! Tanganyika Plateau, 2000–3000 ft., *Whyte*! Manganja Hills, *Meller*!

Imperfectly known Species.

4. **M. parvifolia**, *Lindau* in *Engl. Jahrb.* xxiv. 314. Stem nearly glabrous, hairy at the tip and nodes. Leaves 1 by $\frac{1}{3}$ in., ovate, narrowed at the base, glabrous, petioled. Flowers in the upper axils capitate; bracteoles lanceolate, shorter than the calyx. Calyx $\frac{1}{3}$ in. long:

segments united half their length. Corolla-tube $\frac{1}{3}$ in. long; lower lip $\frac{1}{4}$ in. long, with 3 lobes. Anther-cells spurred at the base. Style hairy.

Mozamb. Dist. Nyasaland; Lufua, *Descamps*.

Lindau says capsule unknown, and does not mention the ovules, but says he has no doubt about the genus of this plant. The corolla appears small for *Mellera*.

11. PAULOWILHELMIA, Hochst.; Benth. et Hook. f. Gen. Pl. ii. 1079.

Calyx deeply divided into 5 subequal linear segments. Corolla 1–3 in. long; tube linear, or (in sect. *Heteradelphina*) inflated in the upper part; lobes 5, contorted in the bud, subequal, all to one side in the typical species. Stamens 4, subsimilar; anther-cells 2, not spurred; pollen long ellipsoid, ribbed lengthwise. Style with one linear-oblong branch, the other very short or 0; ovary with 8 or more ovules, glabrous. Capsule cylindric, usually perfecting 6–16 seeds. Seeds nearly glabrous on the faces; margin with very many hygroscopic hairs.—Shrubs. Leaves long-petioled, ovate, irregularly (often coarsely) toothed. Flowers in scorpioid axillary lax cymes, running into a quasi-terminal panicle; bract ovate, deciduous; bracteoles small or 0.

Species 5, endemic in Tropical Africa.

* **TYPICÆ.** Corolla-tube linear almost to the small mouth; lobes 5, subreflexed, all on one side. (The 4 species here recorded have been estimated but one by a competent botanist.)

Capsule seed-bearing from the base, usually perfecting more than 4 seeds. Calyx segments united $\frac{1}{3}$ the way up.

Calyx $\frac{1}{2}$ in. long; capsule $\frac{1}{2}$ – $\frac{1}{3}$ in. long 1. *P. polysperma*.

Calyx more than $\frac{1}{2}$ in. long; capsule $\frac{1}{2}$ in. long 2. *P. togoensis*.

Capsule usually perfecting 4 seeds, contracted at the base.

Calyx divided nearly to the base, glandular 3. *P. Sclerochiton*.

Calyx-segments united $\frac{1}{3}$ the way up 4. *P. speciosa*.

** **HETERADELPHIA.** Corolla-tube gradually widened upwards into an oblique mouth. Nerves of leaves prominent; corolla-tube 2 in. long 5. *P. nobilis*.

1. ***P. polysperma***, *Benth. in Hook. Niger Fl.* 479. Stems glabrate. Leaves 2–5 in. long, ovate, truncate or subcordate at the base, irregularly toothed or lobed, sparsely pubescent or nearly glabrate; petioles 1–2 $\frac{1}{2}$ in. long. Cymes 1–2 $\frac{1}{2}$ in. long, lax, divided, subscorpioid; bract and bracteoles deciduous. Calyx-segments $\frac{1}{2}$ in. long, united more than $\frac{1}{3}$ their length, sparsely hispid without, hairy within, cystoliths prominent. Corolla purple (*Cummins*); tube 1 $\frac{1}{4}$ in. long, linear, hardly dilated even at the top; lobes $\frac{1}{2}$ in. long, elliptic, all on one side, mauve. Capsule $\frac{1}{2}$ – $\frac{2}{3}$ in. long, usually perfecting 8 (or more) seeds from the base.—Lindau in *Engl. & Prantl, Pflanzenf.* iv. 3B. 301. *P. glabra*, Lindau in *Engl. Jahrb.* xxii. 115.

Upper Guinea. Sierra Leone : near the top of Sugarloaf Mountain, *Scott-Elliot*, 4024 ! on hills, *Powell* ! and without precise locality, *Don* ! *Winwood Reade* ! Gold Coast, *Easmon* ! Ashanti : Assin-Yan-Coomassie, *Cummins*, 181 ! Volta Basin ; between Bame and Kpeve, *Krause* ! Cameroons : Yaunde, 2500 ft., *Zenker & Staudt*, 542 !

The plant from Sugarloaf Mountain has irregular acute lobes $\frac{1}{2}$ – $\frac{1}{3}$ in. deep towards the base of the leaves ; the Cameroon plant has crenate hardly acutely toothed leaves ; there is no difference in hairiness.—Dr. Easmon notes “ Odour celery-like, used to poison fish.”

2. **P. togoensis**, *Lindau in Engl. Jahrb.* xvii. 105. Stems stout, viscid-hairy upwards. Calyx exceeding $\frac{3}{4}$ in. long. Capsule $\frac{3}{4}$ in. long, usually perfecting 12–16 seeds ; otherwise as *P. polysperma*.—*Lindau in Engl. & Prantl, Pflanzenf.* iv. 3B. 300. *P. speciosa*, N. E. Brown in *Gard. Chron.* 1889, vi. 749, fig. 106, exclud. syn., scarcely of Hochst.

Upper Guinea. Togoland : Bismarckburg, *Kling*, 192 ! Segge Stream, 7300 ft., *Büttner*, 342 ! Lagos, *Millen*, 4 ! Yoruba : Ikerim, *Millson* ! Niger Territory : Cross River, *Johnston* !

The wild specimen collected by H. H. Johnston looks separable from *P. polysperma* ; but the plant grown at Kew (from seeds taken off H. H. Johnston's specimen) is much more glabrous, and hardly differs from *P. polysperma*, but by the rather longer capsule.

3. **P. speciosa**, *Hochst. in Flora* 1844, *Beibl.* 5. Stem quadrangular, erect, hairy upwards. Leaves long-petioled ; blade 5–6 in. long, ovate, unequally coarsely toothed, nearly glabrous or somewhat hairy beneath. Inflorescence spicate, leafy, with false whorls of many flowers ; flowers sub-sessile on short dichotomous axillary peduncles ; bracteoles 2, very small, deciduous ; pedicels glandular-pubescent. Sepals (in fruit), $\frac{1}{2}$ in. long, linear-oblong, united for $\frac{1}{3}$ their length, glandular-pubescent without, white hairy within. Corolla-tube exceeding 1 in. long, linear. Capsule $\frac{1}{2}$ by $\frac{1}{10}$ in., glabrous, 4–6-seeded at the top and with sterile ovules below ; seeds $\frac{1}{12}$ in. in diam., discoid, thin, nearly glabrous on the faces, with hygroscopic hairs on the margin.—*Nees in DC. Prod.* xi. 208 ; *Lindau in Engl. & Prantl, Pflanzenf.* iv. 3B. 300, fig. 110, H.

Nile Land. Abyssinia, *Schimper* !

4. **P. Sclerochiton**, *Lindau in Engl. Jahrb.* xvii. 105. Calyx scarcely $\frac{1}{2}$ in. long, divided nearly to the base. Corolla-tube 1 in. long. Capsule less than $\frac{1}{2}$ in. long, perfecting 4 seeds in the upper part ; otherwise as *P. polysperma*.—*Lindau in Engl. & Prantl, Pflanzenf.* iv. 3B. 300. *Ruellia Sclerochiton*, S. Moore in *Journ. Bot.* 1880, 7. *Eremomastax crossandriflora*, *Lindau in Engl. Jahrb.* xx. 8, in *Engl. & Prantl, Pflanzenf.* iv. 3B. 297, and in *Engl. Pfl. Ost-Afr. C.* 367, t. 42.

Upper Guinea. Cameroon Mountains, *Mann*, 1259 partly !

South Central. Congo Free State : Niamniam ; by the River Assika, *Schweinfurth*, 3257 !

Mozamb. Dist. German East Africa : Karagwe ; Bukoba, *Stuhlmann*, 4013.

The corolla in *Eremomastax* is as in other *Paulowilhelmias*. The picture of *Eremomastax* is correct, except that it shows no hairs.

5. **P. nobilis**, *C. B. Clarke*. Shrub 4–5 ft. high (*G. Mann*) ; branches glabrous or glandular-hairy upwards. Leaves up to $3\frac{1}{2}$ by

1 $\frac{3}{4}$ in., ovate-lanceolate, crenate-toothed, somewhat pubescent, petiole 1–2 in. long. Cymes axillary, lax, few-flowered. Calyx $\frac{3}{4}$ in. long, divided nearly to the base, glandular-hairy. Corolla-tube 2 $\frac{1}{4}$ in. long, upper half gradually swollen, curved; lobes $\frac{2}{3}$ in. long, nearly actinomorphic, subquadrate, obliquely erect, deep mauve. Anthers and pollen of genus. Capsule $\frac{2}{3}$ in. long, cylindric, perfecting 8–12 seeds from the base; seeds discoid, glabrous on the faces, with hygroscopic hairs on the margin.—*Heteradelphia Paulowilhelmia*, Lindau in Engl. Jahrb. xvii. 109, xviii. 63, t. 1, fig. 15; in Engl. & Prantl., Pflanzenf. iv. 3B. 302, and in Bolet. Soc. Brot. x. 147.

Lower Guinea. Island of St. Thomas, 4000 ft., *Mann*, 1094! *Moller*, 86!

This plant is made by Lindau the type of a new genus separate from *Paulowilhelmia* by the approximation of the two membranes whence the lateral pairs of stamens spring. The difference in the shape of the corolla would be a stronger reason for separating it generically; but the enormous differences in size and shape of the corolla in allied genera (as in *Ruellia*) do not dispose to attributing much weight even to that character.

12. **MIMULOPSIS**, Schweinf.; Benth et Hook. f. Gen. Pl. ii. 1080.

Calyx divided nearly to the base; segments 5, linear or narrow-ligulate, subsimilar, 2 anticous often rather shorter, posticus rather broader. Corolla about 1 in. long; tube inflated nearly from the base; lobes 5, subequal, ovate, contorted in bud, nearly actinomorphic. Stamens 4, subsimilar; filaments nearly glabrous; anthers of two anticous stamens with one cell long-spurred; pollen short-ellipsoid, somewhat trigonous, ribbed lengthwise. Style hairy below, with one linear-oblong branch, the other very short or 0; ovary with 6 or more ovules. Capsule lanceolate seed-bearing from the base, usually perfecting 6 or 8 seeds. Seeds nearly glabrous on faces; margin with very many hygroscopic hairs.—Shrubs. Leaves long-petioled, ovate, irregularly (often coarsely) toothed. Inflorescence a quasi-terminal panicle, lax or dense; bract usually remote from the calyx; bracteoles 2, linear or ligulate, persistent, shorter than the calyx.

Species 10–12, endemic in Tropical Africa and Mascarenia.

Differs from *Paulowilhelmia* by having 2 anther-cells very strongly spurred, the other 6 muticous or obscurely pointed.

Cymes open, many pedicels up to $\frac{1}{2}$ in. long.

Corolla yellow.

- | | |
|---|---------------------------|
| Calyx-segments linear-ligulate, acute; corolla 1 in. long | 1. <i>M. Solmsii</i> . |
| Calyx-segments linear, obtuse; corolla 1 $\frac{1}{4}$ in. long | 2. <i>M. Thomsoni</i> . |
| Calyx-segments linear, strongly spathulate; corolla 1 in. long | 3. <i>M. spathulata</i> . |
| Corolla pale-violet; calyx-segments 1–1 $\frac{1}{4}$ in. long. | |
| Leaves ovate; calyx-segments acute | 4. <i>M. violacea</i> . |
| Leaves cordate; calyx-segments acute | 5. <i>M. sesamoides</i> . |

Cymes very short, close, pedicels 0– $\frac{1}{8}$ in.

Shrubs.

Floral leaves not exceeding the cymes.

- | | |
|---|---------------------------------|
| Leaves 1 $\frac{1}{2}$ in. long, crenate; ovary closely glandular | 6. <i>M. kilimandscharica</i> . |
|---|---------------------------------|

- Leaves 4 in. long, coarsely toothed; ovary shaggy . . . 7. *M. runsorica*.
 Floral leaves exceeding the cymes, numerous 8. *M. Elliotii*.
 Tree; leaf 9 in. long; petiole 8 in. long 9. *M. arborescens*.

1. **M. Solmsii**, *Schweinf. in Verh. Zool.-Bot. Gesell. Wien*, xviii. 1868, 677. Leaves up to $3\frac{1}{2}$ by $1\frac{1}{2}$ in., ovate-lanceolate, toothed, sparingly pubescent; petioles up to $1\frac{1}{2}$ in. long. Inflorescence viscid hairy, loosely subtrichotomously cymose; pedicels up to $\frac{1}{2}$ in. long. Calyx-segments up to $\frac{3}{4}$ in. long, linear, acute, nearly glabrous within. Corolla 1 in. long, yellow. Pollen ellipsoid. Ovary glabrous, glandular towards the top, 10-ovulate.—*Engl. Hochgebirgsfl. Trop. Afr.* 388; Lindau in *Engl. & Prantl, Pflanzenf.* iv. 3B. 301, and in *Engl. Jahrb.* xviii. 63, t. 1, fig. 18.

Nile Land. Abyssinia: Samen; Ghaba Valley, *Steudner*, 1497!

2. **M. Thomsoni**, *C. B. Clarke*. Leaves of the foot-long panicle all much reduced, sessile, about $\frac{2}{3}$ by $\frac{1}{3}$ in. long. Calyx-segments, obtuse, sometimes almost spatulate. Corolla $1\frac{1}{4}$ in. long; otherwise as *M. Solmsii*.—*Epiclastopelma glandulosum*, Lindau in *Engl. Jahrb.* xxii. 114, and in *Engl. & Prantl, Pflanzenf.* iv. 3B. 305.

Mozamb. Dist. German East Africa: Ukami; Uluguru Mountains, at Bukubuku, 4800 ft., *Stuhlmann*, 8781! Lower Plateau, north of Lake Nyasa, *Thomson!* between Lake Nyasa and Lake Tanganyika, 6000–8000 ft., *Thomson!*

Twice collected by Thomson with good flowers and fruit, but only a fragment of a lower leaf. Capsule $\frac{3}{8}$ in. long, lanceolate, glabrous, 6–8-seeded.

3. **M. spathulata**, *C. B. Clarke*. Sepals scarcely $\frac{1}{2}$ in. long, linear, shortly and strongly dilated at the tip, otherwise as *M. Solmsii*.

Nile Land. British East Africa: Mau, 8000 ft., *Scott-Elliot*, 6060!

The above note was taken at Berlin; I cannot find Scott-Elliot's 6060 in England.

4. **M. violacea**, *Lindau in Engl. Jahrb.* xvii. 105. Shrub 12 ft. high (*Mann*). Leaves up to 7 by $3\frac{1}{2}$ in., ovate-lanceolate, toothed, sometimes doubly toothed or irregularly lobed, sparingly pubescent; petioles 1–3 in. long. Inflorescence viscid-hairy, loosely compound-cymose; pedicels often $\frac{1}{3}$ in. long, or (in one panicle only of *Mann* 2348) much denser with very many flowers and pedicels hardly $\frac{1}{6}$ in. Calyx-segments up to 1 (or even $1\frac{1}{4}$) in. long, linear, acute, nearly glabrous within. Corolla 1 in. long, pale-violet (*Lindau*). Ovary with brown glandular scales nearly to the base, and with few or many long white several-celled hairs at the top or extending nearly to the base. Capsule $\frac{3}{4}$ in. long, lanceolate, minutely hairy, ultimately glabrate, usually perfecting 6–8 seeds.—Lindau in *Engl. & Prantl, Pflanzenf.* iv. 3B. 301, fig. 121, D–H. *M. bicalcarata*, Lindau in *Engl. Jahrb.* xvii. 106, and in *Engl. & Prantl, Pflanzenf.* iv. 3B. 301, fig. 108, D.

Upper Guinea. Cameroons: Buea, 3000–7800 ft., *Preuss*, 814! 1056! Cameroon mountains, 7000 ft., *Mann*, 1260! 1965! Fernando Po, 7000 ft., *Mann*, 2348!

In *M. bicalcarata* the anther of the anticus stamen is said to have one cell long-spurred, the other very short-spurred; but in the authentic example of Lindau, the

anthers are exactly as in *M. violacea*. Granting that a small spur does exist occasionally, it would not constitute an additional species.

5. **M. sesamoides**, *S. Moore in Trans. Linn. Soc. ser. 2, Bot. iv. 30.* Leaves up to $5\frac{1}{2}$ by $3\frac{1}{2}$ in., coarsely toothed or lobed, base cordate; petioles 1–3 in. long. Inflorescence viscid-hairy, loosely compound-cymose. Calyx-segments $\frac{2}{3}$ –1 in. long, linear-ligulate, not acute. Corolla $1\frac{1}{4}$ in. long, perhaps violet (*S. Moore*). Capsule narrowly-oblong-ovoid, somewhat widened upwards, 6–8-seeded; otherwise as *M. violacea*.—Lindau in *Engl. Pfl. Ost-Afr. C. 367.*

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, *Whyte, 89!*

This dried example differs little from those of *M. violacea*, but by the more lobed strongly cordate leaves. As it comes from a different region and the flowers may possibly prove yellow, it is not now united with *M. violacea*.

6. **M. kilimandscharica**, *Lindau in Engl. Jahrb. xx. 10.* Stem 3 ft. high (*Lindau*), scarcely quadrangular. Leaves up to $1\frac{1}{2}$ in. long, margin crenate. Inflorescence 7 by $1\frac{1}{2}$ in., of short dense cymes 1–2 in. apart. Calyx nearly $\frac{1}{2}$ in. long, lobes linear-ligulate, subobtuse, closely covered without by many-celled (some gland-tipped) white hairs, within thinly pubescent. Corolla $\frac{3}{4}$ in. long, white (*H. H. Johnston*). Ovary glandular, scarcely at all hairy.—Lindau in *Engl. & Prantl, Pflanzenf. iv. 3B. 301*, and in *Engl. Pfl. Ost-Afr. C. 367.*

Mozamb. Dist. German East Africa: Kilimanjaro, 7000–8500 ft., *Volken, 963! 1337! Johnston, 12!*

7. **M. runssorica**, *Lindau in Engl. Jahrb. xx. 10.* Hairy. Upper leaves 3–5 in. long, broadly-ovate, acuminate, coarsely toothed, base short-cordate; petioles $1\frac{1}{2}$ in. long. Inflorescence up to 5 by $1\frac{1}{2}$ in., gland-hairy, bracts inconspicuous; upper part a nearly simple raceme with solitary opposite flowers, lower part with short 1–4-flowered spikes in each axil. Ovary densely shaggy with erect several-celled hairs. Capsule densely hairy; otherwise as *M. kilimandscharica*.—Lindau in *Engl. & Prantl, Pflanzenf. iv. 3B. 301*, and in *Engl. Pfl. Ost-Afr. C. 367.*

Nile Land. Ruwenzori, *Stuhlmann, 2424!* without locality, *Scott-Elliot!*

8. **M. Elliotii**, *C. B. Clarke.* Branches stout, quadrangular, densely reflexed-hairy, afterwards glabrate. Leaves up to $2\frac{1}{2}$ in. long, ovate-toothed, pubescent; petioles (seen) hardly $\frac{1}{4}$ in. long. Cymes many, short, compound, several-flowered, forming leafy panicles; pedicels $\frac{1}{8}$ in. long. Calyx-segments up to $\frac{3}{4}$ in. long, linear-ligulate, obtuse, densely hairy without, hairy within (hairs short, mostly 1-celled, none gland-tipped). Corolla $\frac{3}{4}$ in. long. Pollen subglobose. Ovary shaggy.

Nile Land. British East Africa: Ruwenzori; Toru Dist., Yeria Valley, 9000 ft., *Scott-Elliot, 7867!* Wakonjo Dist., Butagu Valley, 10,000–10,500 ft., *Scott-Elliot, 8013!*

The flowering cyme being covered up by the many hardly-reduced leaves gives this species a striking character.

9. **M. arborescens**, *C. B. Clarke*. Tree; branches long, straggling (*Scott-Elliot*); leaf 9 by 6 in., cordate ovate-lanceolate, sparingly hairy, irregularly coarsely toothed; petiole $8\frac{1}{4}$ in. long. Panicle-branches 6 by 2 in.; viscid-hairy at the top; pedicels $\frac{1}{3}$ in. long; floral leaves $\frac{1}{2}$ – $1\frac{1}{2}$ in. long, elliptic, entire, obtuse, densely glandular-hairy, somewhat corolloid, brown-scarious. Calyx-segments 1 by $\frac{1}{10}$ in., glandular pubescent. Corolla $1\frac{1}{4}$ in. long; segments 5, ovate, subequal, contorted in bud; tube in lower half cylindrical, hardly inflated. Stamens (with ellipsoid pollen) of the genus. Ovary nearly glabrous, 6-ovuled, and style of the genus. Capsule $1\frac{1}{2}$ in. long, stalked, glabrous.

Nile Land. British East Africa: Ruwenzori; Toru Dist., at Kivata, *Scott-Elliot*, 7666!

13. **PHYSACANTHUS**, Benth. in Benth. et Hook. f. Gen. Pl. ii. 1085.

Calyx long-tubular, 5-angular; teeth 5, short, triangular-mucronate. Corolla 1–2 in. long; tube linear, only slightly inflated, $\frac{1}{16}$ in. in diam. close to the top; lobes 5, obovate, subequal, contorted in bud. Stamens 4, subsimilar; connective at top bifid, one branch bearing a mucous cell, the other a linear shaggy rudiment; pollen round-ellipsoid, longitudinally 8–12-ribbed. Style hairy upwards; branches 2, short, unequal. Ovary glabrous; ovules about 4 in each cell. Capsule cylindrical or oblong-flattened, perfecting probably more than 4 seeds; young seeds discoid with processes on the margin.—Stems 8–24 in. long, simple, woody, pubescent. Leaves petioled, elliptic, crenate, hairy. Flowers 1–5 in an apparently terminal cluster; bracteoles very small.

The examples of *G. Mann* are excellent; but, in every ripe capsule opened, there is the case of a chrysalis and the seeds are destroyed. The “processes” on the margins of the young seeds would develop either into tubercles or elastic hairs.

Species 2, endemic in Tropical West Africa.

Calyx oblong, in fruit inflated 1. *P. inflatus*.
Calyx in fruit $\frac{1}{8}$ in. broad, cylindrical, scarcely inflated 2. *P. cylindricus*.

1. **P. inflatus**, *C. B. Clarke*. Stems 1–2 ft. high. Leaves up to 6 by $2\frac{1}{4}$ in., hirsute, tip triangular, base narrowed; petiole $\frac{1}{2}$ –1 in. long. Bracteoles $\frac{1}{8}$ – $\frac{1}{6}$ in. long, linear. Calyx (young) 1 in. long, subcylindrical, laxly hairy, (fruiting) up to $1\frac{1}{4}$ by $\frac{1}{2}$ in., glabrate, base truncate; segments scarcely $\frac{1}{6}$ in. long. Corolla-tube up to $1\frac{3}{4}$ in. long; lobes $\frac{1}{2}$ in. long, spreading, mouth of tube shaggy. Style branches oblong, subequal. Capsule 1 in. long, cylindrical or oblong (as seen injured by grubs).—*Ruellia batangana*, Joh. Braun & K. Schum. in Mittheil. Deutsch. Schutzg. ii. (1889) 173. *Lankesteria batangana*, Lindau in Engl. & Prantl, Pflanzenf. iv. 3B. 311. *Haselhoffia leucophthalma*, Lindau in Engl. & Prantl, Pflanzenf. iv. 3B. 305, and in Engl. Jahrb. xxiv. 316.

Upper Guinea. Cameroons: Bipinde, *Zenker*, 987! Batanga, *Bates*, 139! *Braun*, 24!

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1623!

The pollen will not do for *Lankesteria*, where Lindau formerly allocated this species.

2. **P. cylindricus**, *C. B. Clarke*. Stems 3–9 in. high. Leaves up to 3 by $1\frac{1}{4}$ in., obtuse at the tip; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. long, hirsute. Bracts $\frac{1}{3}$ – $\frac{1}{2}$ in. long, obovate-elliptic, hairy; bracteoles minute. Calyx (young) $\frac{2}{3}$ by $\frac{1}{6}$ in., hairy, in fruit $\frac{3}{4}$ by $\frac{1}{5}$ in., a little inflated, glabrate. Corolla white (*Mann*); tube 1 in. long; lobes $\frac{1}{3}$ in. long. Style with one branch longer, subspathulate. Capsule $\frac{1}{2}$ in. long, cylindric.

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1669! 1670!

14. **HEMIGRAPHIS**, Nees; Benth. et Hook. f. Gen. Pl. ii. 1086.

Sepals 5, nearly separate, subequal, linear. Corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long (in African species), not 2-lipped; tube nearly linear-cylindric; segments much shorter, 5, subequal, contorted in bud. Stamens 4, subsimilar; anther-cells 2, short elliptic, muticous; pollen globose, subtrigonous, many-ribbed. Style with one branch suppressed; ovary hairy, with 8 or more ovules. Capsule cylindric, seed-bearing from the base, usually perfecting 6–12 seeds; retinacula rather stout, pointed, falcate; seeds with hygroscopic hairs.—Leaves entire or scarcely crenate. Flowers in small axillary clusters, approximated into quasi-terminal spikes; bract ovate or oblong; bracteoles 0.

Species 20, mostly in India and Malaya, 3 in Africa.

Leaves scarcely $\frac{3}{4}$ in. long, elliptic to oblong.

Spikes 2–4 in. long, many-flowered 1. *H. abyssinica*.

Spikes 1–2 in. long, few-flowered 2. *H. tenera*.

Leaves 2 in. long, lanceolate 3. *H. Schweinfurthii*.

1. **H. abyssinica**, *C. B. Clarke*. Pubescent, wiry; branches 4–12 in. long. Leaves $\frac{2}{3}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., elliptic, entire, subsessile. Spikes 2–4 by $\frac{1}{3}$ in.; bract $\frac{1}{4}$ in. long, elliptic or oblong. Sepals $\frac{1}{4}$ in. long, linear, hairy. Corolla hardly exceeding $\frac{1}{4}$ in. long, not at all 2-lipped. Stamens 4; anthers 2-celled (1 cell occasionally imperfect); pollen of the genus. Capsule $\frac{1}{4}$ in. long, narrowly oblong.—*Polyechma abyssinicum*, Nees in DC. Prod. xi. 83; A. Rich. Tent. Fl. Abyss. ii. 141. *Hygrophila abyssinica*, T. Anders. in Journ. Linn. Soc. vii. 22. *Cardanthera justicioides*, S. Moore in Journ. Bot. 1880, 6.

Nile Land. Sennar, *Kotschy*, 293! White Nile, at El Ehs, *Schweinfurth*, 972! Abyssinia, *Schimper*!

2. **H. tenera**, *C. B. Clarke*. Pubescent; branches 8 in. long. Leaves $\frac{1}{3}$ by $\frac{1}{6}$ – $\frac{1}{5}$ in., elliptic obtuse, nearly entire, subsessile. Spike $\frac{1}{3}$ in. long; flowers 1–2 in each axil; bract $\frac{1}{6}$ in. long, oblong. Sepals $\frac{1}{5}$ in. long, linear-oblong, sparsely hairy. Corolla $\frac{1}{3}$ in. long, not 2-lipped. Filaments glabrous; anther-cells short, muticous; pollen of the genus. Capsule $\frac{1}{6}$ in. long, narrowly oblong, 8–10-seeded, seed-bearing from the base.—*Dyschoriste tenera*, Lindau in Engl. Jahrb. xxii. 116.

Lower Guinea. Angola: Huilla, *Antunes*, 132! 308!

3. **H. Schweinfurthii**, *C. B. Clarke*. Pubescent, especially the inflorescence. Stems 6–11 in. high, erect. Leaves up to $2\frac{1}{4}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., lanceolate, tapering at either end, entire. Flowers in dense axillary and quasi-terminal heads, $\frac{1}{2}$ in. in diam.; bracts $\frac{1}{4}$ – $\frac{1}{3}$ in. long, oblong.

Sepals 5, subequal, nearly distinct, $\frac{1}{6}$ – $\frac{1}{5}$ in. long, linear, acute, hairy, glandular. Corolla less than $\frac{1}{3}$ in. long; tube linear, $\frac{1}{5}$ in. long, slightly widened at the top; lobes 5, small, elliptic, subequal. Stamens 4; anthers small, 2-celled; cells semi-circular, muticous; pollen globose, trigonous, 15-ribbed, 3-pored. Capsule $\frac{1}{4}$ in. long, oblong-lanceolate, hairy, 10–12-seeded; retinacula strong, curved; seeds with hygroscopic hairs.—*Cardanthera africana*, var. *Schweinfurthii*, S. Moore in Journ. Bot. 1880, 7.

Nile Land. Bongo: by the River Sabbi, *Schweinfurth*, 2708! Mittu: at the River Roa, *Schweinfurth*, 2764! at the River Uobko, *Schweinfurth*, 2799!

15. RUELLIOPSIS, C. B. Clarke.

Calyx deeply divided; segments 5, linear, unequal. Corolla 1–1½ in. long, not 2-lipped; tube funnel-shaped for $\frac{2}{3}$ its length; segments 5, subequal, round, contorted in bud. Stamens 4, subsimilar; anther-cells 2, oblong, parallel, spurred in the type species; pollen globose, smooth, many- (12-) ribbed. Ovary with 4 ovules in each cell; style hairy, with one linear, one suppressed, stigmatic branch. Capsule cylindrical, 8-seeded from the base; seeds hygroscopically hairy on the margin.—Small shrubs. Leaves linear, entire. Flowers solitary, axillary; bracteoles linear, shorter than the calyx.

Species 1 extending to South Africa, with 1 other doubtfully referred here.

Anther-cells tailed	.	:	:	:	:	:	1. <i>R. setosa</i>
Anther-cells not tailed	.	:	:	:	:	:	2. <i>R. mutica</i>

1. ***R. setosa***, C. B. Clarke. Root woody; branches 15 in. long, trailing, hispid. Leaves up to 2½ by ¼ in., obtuse, hispid with long scattered white hairs. Calyx $\frac{2}{3}$ – $\frac{3}{4}$ in. long. Corolla 1¼ in. long, bright or pale blue; tube more than $\frac{3}{4}$ in. long. Anther-cells tailed. Capsule $\frac{1}{2}$ – $\frac{2}{3}$ in. long, glabrate, with 8 silky-white seeds.—*Calophanes setosus*, Nees in DC. Prod. xi. 112; T. Anders. in Journ. Linn. Soc. vii. 24.

Mozamb. Dist. North Kalahari Desert: near Chukutsa Salt-pan, *Lugard*, 220! near T'Klakane Pits, *Lugard*, 245!

The 8 seeds take this species out of *Dyschoriste*.

Also in South Africa.

2. ***R. mutica***, C. B. Clarke. Minutely white-bristly, mostly glabrate. Leaves up to 2 by ½ in., mostly glabrate. Flowers solitary; bracteoles linear, shorter than calyx. Calyx ½ in. long or rather more, divided nearly to the base; segments 5, linear, unequal, with scattered minute white bristles. Corolla exceeding 1 in. long. Stamens 4; anther-cells not tailed; pollen globose, smooth, many-ribbed. Style glabrous, with 1 linear-oblong branch; ovary glandular near the top, with 6 imbricated ovules in each cell.

Tropical Africa (?) South African Goldfields, *Baines*!

This plant differs from the type *R. setosa* in the anthers, the cells of which are slightly unequal, divaricated in the lower half and muticous: it differs from *Hygrophila* in the corolla which is altogether as of *Ruellia*, and from *Ruellia*, in the pollen. In technical characters, it is a *Hemigraphis*. It is very possible that *Calophanes hyssopifolius*, Nees (recorded below at the end of *Dyschoriste*), may be allied.

16. **DISTICHOCALEYX**, Benth. in Benth. et Hook. f. Gen.
Pl. ii. 1080.

Calyx anticous 2 segments free to the base, posticous 3 united more than $\frac{3}{4}$ their length (only $\frac{1}{3}$ their length in *D. thunbergiiflorus*). Corolla large or medium; tube inflated in upper half; lobes 5, subequal, round, contorted in bud. Stamens 4; filaments nearly glabrous, gland-bearing near the top; anthers all alike, not spurred; pollen globose, echinate. Style nearly glabrous, 1 stigmatic branch large spatulate, the other obsolete; ovary narrowly oblong, glabrous, with at least 4 (usually 6–8) ovules in each cell. Capsule linear-cylindric, small, slender, many-seeded (usually perfecting 10–14 seeds where known) from the base; but in *D. thunbergiiflorus* (though similarly constructed) much larger. Seeds having the faces glabrous, the margins with many white hygroscopic hairs.—Small shrubs, bearing cystoliths everywhere, sparingly hairy (*D. hirsuta* moderately hairy). Leaves petioled, entire. Flowers purple-blue or white, 3–16 in a terminal spike or head, elongated and loose in *R. thunbergiiflorus*; bract close to the calyx, ovate or elliptic, about as long as the calyx; bracteoles very small, oblong.

Species 8, endemic in Tropical Africa.

T. Anderson founded in MS. his genus *Dischistocalyx* in herb. Kew on six of the species below; he diagnosed the genus from *Ruellia* entirely by the calyx, and therefore he described as *Ruellia thunbergiiflora* the eighth species below, as it has the calyx divided for $\frac{2}{3}$ its length, often irregularly or sometimes subequally 5-partite nearly to the base. Bentham published the genus as *Distichocalyx* (in Benth. & Hook. f. Gen. Pl. ii. 1080), making an error in the name and widening the calyx-character to include *Ruellia thunbergiiflora*. *Dischistocalyx* Lindau (in Engl. & Prantl, Pflanzenf. iv. 3B. 307) does not contain any one of the 7 species included by Bentham; it has equal calyx-segments, and is stated to have 10 or 12 seeds in each cell, but the two species which Lindau really possessed, viz. his *Dischistocalyx laxiflorus*, and *D. confertiflorus*, have only 2 ovules to each cell of the ovary, and are closely congeneric with *Pseudostenophonium rhamnifolium*, Lindau. The first six species of *Distichocalyx* below described are so intimately allied that the essential part of the description of all is included in the above generic description; it is remarkable that Bentham should have brought *Ruellia thunbergiiflora* here in the teeth of T. Anderson's generic characters (which make it a *Ruellia*); his instinct has been confirmed by the discovery that this species has the pollen of *Distichocalyx*—not of *Ruellia*.

Calyx 2 anticous lobes free, 3 posticous united nearly to the top. Inflorescence dense. Capsule and seeds very small.

Corolla $1\frac{1}{2}$ –2 in. long.

Leaves less than 2 in. broad.

Stem glabrous or nearly so.

Leaves narrow-lanceolate; corolla $1\frac{1}{2}$ in. long 1. *D. angustifolius*.

Leaves elliptic-lanceolate; corolla 2 in. long 2. *D. polyneurus*.

Stem and leaves thinly shaggy 3. *D. hirsutus*.

Leaves $4\frac{1}{4}$ in. broad; corolla $1\frac{3}{4}$ in. long 4. *D. grandifolius*.

Corolla about 1 in. long, rather slender.

Leaves up to 4–7 in. long.

Leaves 7 in. long; spike strobilate 5. *D. strobilinus*.

Leaves 4 in. long; head small, ovoid 6. *D. capitellatus*.

Leaves up to $1\frac{1}{2}$ in. long; head of 2–4 flowers 7. *D. brevifolius*.

Calyx divided $\frac{2}{3}$ the way to the base. Spike elongate loose.

Capsule and seeds medium-sized 8. *D. thunbergiiflorus*.

1. **D. angustifolius**, *C. B. Clarke*. Nearly glabrous. Leaves up to $5\frac{1}{2}$ by 1 in., tapering at both ends, main nerves $\frac{1}{2}$ in. apart; petiole $\frac{1}{2}$ –1 in. long. Flowers 5–10, in a close head; bract $\frac{3}{4}$ in. long, elliptic, oblong. Calyx $\frac{3}{4}$ in. long, nearly glabrous; teeth of 3 posticous lobes triangular, acute, less than $\frac{1}{6}$ in. long. Corolla $1\frac{1}{2}$ in. long, purple when dry; upper half of tube $\frac{1}{3}$ – $\frac{1}{2}$ in. in diam.

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1668! Mfoa, *Bates*, 534!

In the note to *Distichocalyx* (in Benth. & Hook. f. Gen. Pl. ii. 1081), Bentham observes that his *D. thunbergiiflorus* has the 3 posticous calyx-segments sometimes, not always, connate. The true *D. thunbergiiflorus* has the 5 calyx-segments free to the base, the present plant (mixed formerly with *D. thunbergiiflorus*) is the ground for the above note. But Bentham subsequently noted on G. Mann's, 1668, "I think different from *thunbergiiflorus*"—he forgot (or it was too late) to correct the remark in Gen. Pl.

2. **D. polyneurus**, *C. B. Clarke*. Very sparingly hairy. Leaves up to $5\frac{1}{2}$ by $1\frac{3}{4}$ in., acute at both ends; main nerves $\frac{1}{6}$ – $\frac{1}{4}$ in. apart, beneath very prominent; petiole $\frac{1}{4}$ – $\frac{3}{4}$ in. long, hirsute. Flowers 5–10 in an ovoid head; bract $\frac{3}{4}$ in. long, elliptic. Calyx $\frac{3}{4}$ in. long or more; teeth of 3 posticous lobes triangular, acute, $\frac{1}{5}$ in. long. Corolla 2 in. long, purple when dry; upper half of tube $\frac{1}{3}$ – $\frac{1}{2}$ in. in diam.

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1667!

3. **D. hirsutus**, *C. B. Clarke*. Stem 2 ft. high, shaggy with brown hair. Leaves up to $4\frac{1}{2}$ by 2 in., shortly acuminate at both ends, shaggy with brown hairs obscuring cystoliths on both surfaces; main nerves $\frac{1}{3}$ in. apart, not conspicuous beneath. Bracts and calyx shaggy with brown hairs. Corolla light purple (*Bates*); otherwise as *D. polyneuros*.

Lower Guinea. Spanish Gaboon: Mount John, River Kongui, *Mann*, 1874! Gaboon: Mfoa, *Bates*, 521!

The brown shaggy hairs sometimes on the petioles of *D. polyneurus* suggest the possibility that the present species may be a variety of it. The close, parallel, very strong, main nerves of the leaves in *D. polyneurus* are, however, not seen here.

4. **D. grandifolius**, *C. B. Clarke*. Nearly glabrous. Leaves up to 7 by $4\frac{1}{4}$ in.; petiole 1 in. long. Spike 3 by 1 in., strobilate; bracts $\frac{3}{4}$ by $\frac{1}{3}$ in., purple (*Bates*). Calyx $\frac{2}{3}$ in. long, nearly glabrous; 3 posticous segments united for $\frac{3}{4}$ their length. Corolla $1\frac{2}{3}$ in. long, blueish purple (dried).

Lower Guinea. Gaboon: Mfoa, *Bates*, 511!

5. **D. strobilinus**, *C. B. Clarke*. Nearly glabrous. Leaves up to 7 by $3\frac{1}{4}$ in., shortly acuminate at either end; petiole 1 in. long. Flowers up to 15 in a continuous spike $1\frac{1}{2}$ by $\frac{1}{2}$ in.; bracts $\frac{2}{3}$ in. long, broadly elliptic, covering the calyx; bracteoles $\frac{1}{4}$ in. long, oblong. Calyx $\frac{1}{3}$ in. long, or rather more; teeth of 3 posticous segments triangular, $\frac{1}{12}$ – $\frac{1}{10}$ in. long. Corolla 1 in. long, white (*Mann*, *Bates*), upper part of tube widening, hardly $\frac{1}{6}$ in. in diam. Capsule $\frac{1}{3}$ by $\frac{1}{16}$ in.

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1673! Mfoa, *Bates*, 507!

6. **D. capitellatus**, *C. B. Clarke*. Very sparsely hairy; stem 1 ft. high. Leaves up to 4 by $1\frac{1}{2}$ in., acuminate at both ends, very thin in

texture; petiole $\frac{3}{4}$ in. long. Heads $\frac{3}{4}$ in. long, ovoid, 2-9-flowered; bract $\frac{1}{2}$ in. long, ovate. Calyx $\frac{1}{2}$ in. long, or rather more; otherwise as *D. strobilinus*.—*Dischistocalyx* sp., Lindau in Engl. Jahrb. xviii. 63, t. 1, fig. 26.

Lower Guinea. Gaboon: Corisco Bay, *Mann*, 1863!

With only one collection of each number, it is difficult to guess whether the present is "specifically" distinct from *D. strobilinus*. T. Anderson and Bentham took it to be so.

7. ***D. brevifolius***, *C. B. Clarke*. Nearly glabrous, "herbaceous, 2 feet" (*Mann*). Leaves $1\frac{1}{2}$ by $\frac{3}{4}$ in., acuminate at either end, tip obtuse, base produced nearly to the foot of the petiole, somewhat leathery. Heads of 2-4 flowers only. Calyx exceeding $\frac{1}{2}$ in. long. Corolla light blue (*Mann*). Flowers, pistil, stamens, pollen, as of the last 2 species.

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1665!

This, though very closely allied to the preceding two species, appears distinct from either.

8. ***D. thunbergiiflorus***, *Benth. in Benth. & Hook. f. Gen. Pl. ii. 1081*. Glabrous (calyx-tips microscopically pubescent). Stem 4-20 ft. high (*Mann*). Leaves up to 6 by 2 in., acuminate at either end, cystoliths many prominent; petiole $\frac{1}{2}$ - $1\frac{1}{2}$ in. long. Spikes terminal, elongating in fruit up to 3 in., 4-10-flowered, lower flowers solitary, opposite, $\frac{1}{4}$ - $\frac{1}{2}$ in. from the succeeding pair; bract $\frac{3}{4}$ -1 in. long, elliptic, deciduous; bracteoles hardly $\frac{1}{4}$ in. long, narrow-oblong. Calyx-lobes 5, $\frac{3}{4}$ in. long, nearly equal, linear-lanceolate; the 3 posticous sometimes connate even in fruit $\frac{1}{3}$ their length, sometimes free even in the bud nearly to their base. Corolla 2 in. long, upper $\frac{2}{3}$ of the tube much inflated, $\frac{1}{2}$ - $\frac{2}{3}$ in. in diam., curved; lobes $\frac{1}{2}$ in., round, violet-purple. Filaments glabrous, with glands near the top; pollen globose, echinate. Ovary and style glabrous; style-branches one obsolete, one broad ovate-oblong. Capsule $\frac{3}{4}$ by $\frac{1}{8}$ - $\frac{1}{10}$ in., subcylindric, about 16-seeded, seed-bearing from the base; seeds $\frac{1}{16}$ in. in diam.—*Ruellia thunbergiæflora*, T. Anders. in Journ. Linn. Soc. vii. 24; Lindau in Engl. & Prantl, Pflanzenf. iv. 3B. 310.

Upper Guinea. Fernando Po, 1300-2000 ft., *Mann*, 316! 1446!

17. ACANTHOPALE, C. B. Clarke.

Calyx divided nearly to the base; segments 5, subequal, narrow-oblong or linear. Corolla 1- $1\frac{1}{2}$ in. long; tube dilated nearly from the base, funnel-shaped; lobes 5, short, subequal, contorted in bud. Stamens 4, subsimilar; anther-cells 2, linear-oblong, parallel, at equal height, glabrous, base rounded; pollen globose, echinate. Ovary glabrous; ovules 2 in each cell; style hairy, one branch linear-oblong, the other minute or 0. Capsule broad-oblong, contracted, solid at the base; seeds with many hygroscopic hairs.—Shrubs. Leaves entire, more or less crenate, becoming nearly glabrous in age. Inflorescence lax or dense.

mostly on short axillary branches; bract as long as the calyx, oblong or obovate, green; bracteoles shorter than the calyx, oblong.

Species 7 in Tropical Africa, 1 in Madagascar, 1 (at least) in South India.

This genus comprises the African *Strobilanthes* of the Genera Plantarum. The species of *Strobilanthes*, alone retained in that genus by Lindau, have ribbed pollen. *Acanthopale* is *Dischistocalyx*, Lindau (not of Anderson nor *Distichocalyx*, Benth.), and also comprises *Pseudostenosiphonium gardnerianum*, Lindau. The genera carved out of *Strobilanthes* on the pollen-character are artificial; the few African species of *Strobilanthes* go, however, well together. *Pseudostenosiphonium* of Lindau differs by having only 2 stamens.

Inflorescence lax; flowers (other than the subterminal) solitary.

Nearly (including bracts and calyx) glabrous.

Leaves more than 3 in. long.

Racemes lax; filaments hairy 1. *A. laxiflora*.

Racemes closer; filaments glabrous 2. *A. decempedalis*.

Leaves hardly $1\frac{1}{2}$ in. long. Flowers all axillary, scattered 3. *A. azaleoides*.

Innovations hispid.

Mature leaves nearly glabrate 4. *A. albosetulosa*.

Mature leaves hairy on both faces 5. *A. pubescens*.

Flowers crowded. (Leaves up to 8-9 in. long.)

Heads of flowers on short axillary branches, hispid 6. *A. confertiflora*.

Spikes terminal, dense, nearly glabrous 7. *A. Buchholzii*.

1. ***A. laxiflora***, *C. B. Clarke*. Nearly glabrous. Leaves 8 by $\frac{2}{3}$ in., tapering caudate at both ends, crenate; petiole up to $1\frac{1}{2}$ in. long. Racemes axillary, 2-3 in. long, with few distant flowers; bract $\frac{1}{2}$ in. long, oblong; bracteoles $\frac{1}{4}$ in. long, oblong. Calyx-segments $\frac{1}{3}$ in. long, oblong; corolla-tube $\frac{3}{4}$ in. long, funnel-shaped nearly from the base. Filaments very hairy; anthers glabrous, rounded at the base. Style hairy.—*Dischistocalyx laxiflorus*, Lindau in Engl. Jahrb. xx. 13, in Engl. & Prantl, Pflanzenf. iv. 3B. 307, and in Engl. Pfl. Ost-Afr. C. 368.

Upper Guinea. Cameroons: Buea, 3900 ft., *Preuss*, 947!

Mozamb. Dist. German East Africa: Usambara; in Magamba Forest, *Holst*, 3840!

2. ***A. decempedalis***, *C. B. Clarke*. Shrub 10-12 ft. high (*Mann*). Leaves 7 by $2\frac{1}{2}$ in., tapering acute at both ends, sparsely hairy, crenate; petiole up to $\frac{3}{4}$ in. long. Racemes axillary, $1\frac{1}{2}$ in. long, 2-4-flowered; bract $\frac{1}{3}$ in. long, spathulate-oblong; bracteoles and calyx-segments $\frac{1}{4}$ in. long, oblong, nearly glabrous. Corolla-tube $\frac{2}{3}$ in. long, funnel-shaped nearly from the base. Filaments glabrous; anther-cells glabrous, rounded at the base. Style hairy, with one linear-oblong branch; cells of the ovary 2-ovulate.

Upper Guinea. Fernando Po, 7000 ft., *Mann*, 2347! 3747!

3. ***A. azaleoides***, *C. B. Clarke*. A nearly glabrous, azalea-like bush (*H. H. Johnston*). Leaves up to $1\frac{1}{3}$ by $\frac{1}{2}$ in., obscurely crenate, tip obtuse, base tapering; petiole hardly any. Flowers scattered, axillary, solitary; bract $\frac{1}{4}$ - $\frac{1}{3}$ in. long, obovate; bracteoles $\frac{1}{4}$ in. long, narrow-oblong. Calyx-segments $\frac{1}{4}$ in. long, narrow-oblong, minutely pubescent. Corolla white (*H. H. Johnston*); tube $\frac{2}{3}$ in. long, funnel-shaped nearly

from the base. Filaments glabrous; anther-cells glabrous, rounded at the base. Style hairy, with one linear-oblong branch; cells of the ovary 2-ovulate.—*Strobilanthes* sp. nova, Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 345.

Mozamb. Dist. German East Africa: Killimanjaro, 6000–7000 ft., *Johnston*, 12!

4. **A. albosetulosa**, *C. B. Clarke*. Innovations and bracts with white bristly hairs. Leaves up to $3\frac{1}{2}$ by 1 in. (only upper seen) long, tapering at the base, nearly glabrate; cystoliths small, prominent on both surfaces; petiole $1-1\frac{1}{2}$ in. long. Flowers axillary, solitary, those near the end of branchlets approximate; bract $\frac{1}{2}$ by $\frac{1}{5}$ in., spathulate-obovate; bracteoles $\frac{1}{4}$ in. long, linear-oblong, slightly widened at the top. Sepals 5, $1\frac{1}{4}$ in. long, subequal, linear-lanceolate, minutely scabrous. Corolla $1\frac{1}{4}$ in. long; tube funnel-shaped nearly from the base. Filaments glabrous; anther-cells glabrous, rounded at the base, slightly glandular on the back. Style hairy, with one linear-oblong branch; ovary glabrous; ovules 2 in each cell.

Mozamb. Dist. British Central Africa: Nyasaland; Masuku Plateau, 6500–7000 ft., *Whyte*!

5. **A. pubescens**, *C. B. Clarke*. Branches, leaves on both surfaces, and inflorescence hairy. Leaves 3 by 1 in., entire acuminate, decurrent at the base; petiole $\frac{1}{4}-\frac{1}{2}$ in. long. Flowers 1–3 on small axillary branches, with reduced floral leaves (or bracts) $\frac{1}{2}-1$ in. long, spathulate. Calyx $\frac{1}{4}$ in. long, divided to the base; sepals equal, very narrowly oblong, hairy. Corolla-tube 1 in. long, widely funnel-shaped from the base; mouth subequally 5-lobed. Stamens 4; anthers similar, 2-celled; cells parallel, oblong, muticous; pollen strongly echinate; filaments slightly hairy. Style hairy; stigma of one branch.—*Dischistocalyx pubescens*, Lindau ex Engl. in Götzen, *Durch Africa*, Sonderabdr. 9.

South Central. Congo Free State: in forest on Kirunga Volcano, north of Lake Kivu, 8000 ft., *Götzen*, 58!

Strobilanthes madagascariensis, Baker in Journ. Linn. Soc. xx. 220, is very close to (if not identical with) this.

6. **A. confertiflora**, *C. B. Clarke*. Thinly hairy. Leaves up to 9 by 4 in., suddenly narrowed at both ends, acuminate, obscurely crenulate; petiole 1 in. long. Heads of flowers $1-1\frac{1}{2}$ in. in diam., subglobose, axillary and on short axillary branches; bract $\frac{1}{2}$ in. long, obovate; bracteoles $\frac{1}{3}$ in. long, oblong. Calyx $\frac{1}{3}$ in. long; segments linear-lanceolate, hairy. Corolla-tube $\frac{3}{4}$ in. long, funnel-shaped nearly from the base. Filaments glabrous; anther-cells glabrous, rounded at the base. Style hairy.—*Dischistocalyx confertiflorus*, Lindau in Engl. Jahrb. xx. 13, in Engl. & Prantl, *Pflanzenf.* iv. 3B. 307, and in Engl. *Pfl. Ost-Afr.* C. 368.

Nile Land. British East Africa: Upper Ituri River, 3400 ft., *Stuhlmann*, 2687!

Mozamb. Dist. Nyasaland, *Buchanan*, 22!

7. **A. Buchholzii**, *C. B. Clarke*. Shrub. Leaves up to 8 by $2\frac{1}{2}$ in., acute at either end, crenulate, nearly glabrous; petiole $\frac{1}{2}-1\frac{1}{2}$ in. long.

Spikes terminal, $2\frac{1}{2}$ by 1 in., dense, 6-16-flowered, nearly glabrous; bracts $\frac{1}{2}$ - $\frac{3}{4}$ in. long, elliptic. Sepals 5, equal, $\frac{1}{4}$ - $\frac{1}{3}$ in. long, linear-oblong, minutely sparsely setose. Corolla 1 in. long or more. Stamens 4, subsimilar; anther-cells 2, parallel, long, rounded at the base; pollen strongly echinate. Ovary glabrous.—*Dischistocalyx Buchholzii*, Lindau in Engl. Jahrb. xx. 14, and in Engl. & Prantl, Pflanzenf. iv. 3B. 307.

Lower Guinea. Gaboon: *Buchholz!*

18. **WHITFIELDIA**, Hook.; Benth. et Hook. f. Gen. Pl. ii. 1085.

Calyx divided nearly to the base, longer than the bracteoles, petaloid in texture, softly hairy; segments 5, subequal, narrow-oblong. Corolla large; tube linear and very long, or shorter and dilated nearly from the base; lobes 5, subequal, contorted in bud, subequal. Stamens 4, subsimilar; anthers linear-oblong, muticous; pollen globose, nearly smooth (with minute tubercles); stopples 2. Ovary glabrous, 2 ovules in each cell; style articulated close above the ovary and more or less widened at the base, or continuous at base and ovary-top tapering into it; stigma capitate, obscurely 2-lobed. Capsule stalked, 2- or 4-seeded, glabrous; seeds discoid, without hairs, nearly smooth.—Shrubs, 2-20 ft. high, nearly glabrous except the inflorescence. Leaves elliptic, acuminate at both ends, petioled, margins entire. Inflorescence terminal, simple or branched, racemose or spicate or more or less paniced; flowers pedicelled (usually $\frac{1}{8}$ - $\frac{1}{3}$ in.) above the bract; bract large or small, ovate or linear, often caducous; bracteoles large, ovate, membranous or subcorolloid.

Species 9, endemic.

The articulation at the base of the style is a remarkable character in the *Acanthaceæ*, and Baillon hastened to found his genus *Stylarthropus* thereon, without examining the two old species of *Whitfieldia*, which also have this articulation. Lindau, following, leaves the two old *Whitfieldias* in that genus, and creates two new species of *Stylarthropus* which do not possess the articulation.

Linear part of corolla-tube 1-2 in. long.

Bracteoles glabrous.

Bract green persistent; corolla glandular 1. *W. elongata*.

Bract caducous; corolla finely hairy 2. *W. perglabra*. ✓

Bracteoles viscid-hairy.

Leaves closely dotted on the upper surface 3. *W. longifolia*. ✓

Leaves not or very obscurely dotted.

Bract caducous; panicle open 4. *W. subviridis*. ✓

Bract large, green; flowers spicate 5. *W. tanganyikensis*. ✓

Linear part of corolla-tube $\frac{1}{8}$ - $\frac{1}{3}$ in. long.

Bracts $\frac{1}{8}$ - $\frac{1}{4}$ in. long, linear.

Bracteoles pubescent 6. *W. lateritia*. ✓

Bracteoles scarcely puberulous 7. *W. Preussii*. ✗

Bracteoles glabrous 8. *W. Brazzei*.

Bracts $\frac{1}{2}$ - $\frac{3}{4}$ in. long, lanceolate; innovations stellate-hairy 9. *W. Stuhlmanni*.

1. ***W. elongata***, *C. B. Clarke*. Nearly glabrous except the calyx. Upper leaves up to 8 by 3 in., closely dotted on the upper face; petiole 1 in. long. Racemes 1–3, simple, 2–5 in. long; bracts $\frac{1}{2}$ in. long, elliptic-acuminate, green, subpersistent; pedicel $0-\frac{1}{4}$ in. long. Linear part of corolla-tube 1 in. long; lobes glandular, without fine white hairs, greenish-white (*Vogel*), figured light-blue by *Beauvois*. Stamens glabrous, connective glandular. Style glabrous, articulated on the ovary.—*W. longifolia*, *T. Anders.* in *Journ. Linn. Soc.* vii. 27 in small part. *Ruellia elongata*, *Beauv. Fl. Owar.* i. 45, t. 26. *Dipteracanthus elongatus*, *Nees* in *DC. Prod.* xi. 140; *Benth.* in *Hook. Niger Fl.* 478.

Upper Guinea. Oware, *Beauvois!* Fernando Po, *Vogel*, 187, 242!

2. ***W. perglabra***, *C. B. Clarke*. Nearly glabrous except the calyx. Upper leaves 6 by $1\frac{1}{2}$ in., closely dotted on the upper surface; petiole $\frac{1}{3}$ in. long. Raceme $2\frac{1}{2}$ in. in diam., lower branches divided; bracteoles up to $\frac{3}{4}$ in. long, elliptic-lanceolate acute. Corolla-tube and lobes without glands, nearly glabrous.—*Stylarthropus tenuiflora*, *Baill.?* in *Bull. Soc. Linn. Paris*, ii. [1890], 823; *Lindau* in *Engl. & Prantl, Pflanzenfam.* iv. 3B. 306.

Upper Guinea. Fernando Po, *Mann!*

This has been named *W. longifolia*, by *T. Anderson*, and also numbered as 198, which is *W. subviridis*, but not by *G. Mann*. *Stylarthropus tenuiflora*, *Baill.* in *Bull. Soc. Linn. Paris*, ii. [1890], 823, which is very imperfectly described, may be this plant.

3. ***W. longifolia***, *T. Anders.* in *Journ. Linn. Soc.* vii. 27, partly. Shrub 8 ft. high (*Barter*). Upper leaves up to 6–8 by 2–3 in., closely dotted on the upper face; petiole $0-\frac{1}{2}$ in. long. Racemes 1–3, simple, pubescent; bracts small, caducous. Calyx $\frac{3}{4}-1$ in. long. Corolla white; linear part of the tube $1-1\frac{1}{4}$ in. long; lobes soft with fine white hairs, no glands. Style articulated on the ovary. Capsule $1\frac{1}{4}$ in. long, 4-seeded, glabrous; stalk half the length of the capsule; seeds $\frac{1}{4}$ in. in diam. smooth, glabrous.—*Lindau* in *Engl. & Prantl, Pflanzenf.* iv. 3B. 306. *W. longiflora*, *S. Moore* in *Journ. Bot.* 1880, 229; *Lindau* in *Engl. Pfl. Ost-Afr. C.* 367 partly.

Upper Guinea. Cameroons: Yaunde, *Zenker*, 69! and without precise locality, *Zenker*, 759B! Fernando Po, *Barter*, 2069!

Lower Guinea. Angola, *Welwitsch*, 5086! 5152! 5153! 5193! *Mechow*, 156!

Nile Land. British East Africa: Sesse Islands, in Lake Victoria Nyanza, *Stuhlmann*, 1213!

Mozamb. Dist. German East Africa: Karagwe; Bukoba, *Stuhlmann*, 1021! Usambara; Lutindi, *Holst*, 3297! Gonja, *Holst*, 4266!

4. ***W. subviridis***, *C. B. Clarke*. Shrub, up to 20 ft. high (*Mann*). Leaves up to 10 by $4\frac{1}{2}$ in., usually smaller, not or remotely and obscurely dotted on the upper face; petiole $\frac{1}{2}-1\frac{1}{2}$ in. long. Inflorescence loosely or densely paniculate, pubescent; bracts small, caducous; bracteoles $\frac{1}{2}-\frac{3}{4}$ in. long, elliptic, acute. Calyx $1-1\frac{1}{2}$ in. long. Linear part of corolla-tube $1\frac{1}{4}-2$ in. long; lobes with some fine white hairs. Style

articulated on the ovary; otherwise as *W. longifolia*.—*W. longifolia*, T. Anders. in Journ. Linn. Soc. vii. 27 partly. *W. longiflora*, S. Moore in Journ. Bot. 1880, 229 partly.

Upper Guinea. Lagos, *Millen*, 141! 181! 195! Old Calabar, *Robb*! Cameroons: Yaunde, *Zenker*, 547! Fernando Po, *Mann*, 198!

Lower Guinea. Lower Congo: Lisha, 3000 ft., *Hens*, 343! Angola: Golungo Alto; Rio de Capopa, *Welwitsch*, 5151!

Nile Land. British East Africa: Mombasa, *Wakefield*!

5. ***W. tanganyikensis***, *C. B. Clarke*. Upper leaves 5 by 2 in.; petiole up to $\frac{3}{4}$ in. long. Inflorescence of 3–1 spikes, each 4–5 in. long, viscid-pubescent; bracts large, some 1 in. long resembling leaves, persistent; bracteoles up to $\frac{3}{4}$ in. long, acute, greenish, pubescent. Flowers as of *W. subviridis*.

Nile Land. British East Africa: Buddu, *Scott-Elliott*, 7528!

Mozamb. Dist. Tanganyika Plateau, *Carson*, 22!

6. ***W. lateritia***, *Hook. Bot. Mag. t.* 4155. Shrub 1–10 ft. high. Upper leaves up to 7 by 2 in.; petiole $\frac{1}{4}$ – $\frac{3}{4}$ in. long. Raceme terminal, simple, 2–4 in. long, pubescent; bracts $\frac{1}{4}$ – $\frac{1}{3}$ in. long, linear, deciduous; lower pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in. long, pubescent. Corolla red; tube 1 in. long, inflated, narrow-campanulate from near the base. Stamens glabrous. Style glabrous, articulated on the ovary.—*Nees* in DC. Prod. xi. 221; *Benth.* in *Hook. Niger Fl.* 480; *T. Anders.* in Journ. Linn. Soc. vii. 27; *Lindau* in Engl. & Prantl, Pflanzenfam. iv. 3B. 306, fig. 110, A.

Upper Guinea. Sierra Leone: Lumbaraya, *Scott-Elliott*, 4933! and without precise locality, *Scott-Elliott*, 3976! *Winwood Reade*! *Whitfield*! *Afzelius*!

7. ***W. Preussii***, *C. B. Clarke*. Nearly glabrous, except the calyx. Upper leaves 7 by $2\frac{1}{4}$ in.; petiole $\frac{1}{2}$ –1 in. long. Inflorescence 7 by $\frac{3}{4}$ in., raceme with 2 pedicels up to $\frac{1}{4}$ in. long from a few lower axils (i.e., panicle nearly reduced to a raceme); bracts $\frac{1}{8}$ – $\frac{1}{6}$ in. long, linear. Calyx $\frac{1}{2}$ in. long, microscopically pubescent. Corolla yellow (*Lindau*); tube $\frac{3}{4}$ in. long, inflated nearly from the base. Anther-cells hairy. Style hairy; ovary conical at the top, passing continuously into the style.—*Stylarthropus Preussii*, *Lindau* in Engl. Jahrb. xx. 12, and in Engl. & Prantl, Pflanzenfam. iv. 3B. 306, fig. 123, A–C.

Upper Guinea. Cameroons: Barombi, *Preuss*, 516!

8. ***W. Brazzei***, *C. B. Clarke*. Glabrous, except the corolla and calyx. Leaf 4 by 1 in., attenuate at each end, willow-like; petiole $\frac{1}{6}$ in. long. Panicle with solitary flowers; bracts $\frac{1}{6}$ in. long, linear; bracteoles $\frac{1}{2}$ in. long, broad-elliptic, subobtuse, whitish. Sepals $\frac{1}{3}$ in. long, linear-oblong, sparingly viscous-pubescent. Corolla-tube $\frac{3}{4}$ in. long, inflated nearly from the base. Capsule (from *Thollon's* specimen) $\frac{3}{4}$ in. long, glabrous, stalked, 2-seeded; seeds discoid, glabrous, nearly smooth.—*Stylarthropus Brazzei* and *S. Tholloni*, *Baill.* in Bull. Linn. Soc. Paris, ii. [1890], 823; *Lindau* in Engl. & Prantl, Pflanzenfam. iv. 3B. 306, and in Engl. Jahrb. xviii. 63, t. 1, fig. 25.

Lower Guinea. French Congo: Bateke Dist.; in the woods of Osika, *Brazza*, 165! near Brazzaville on the Lower Congo, *Thollon*, 210!

9. **W. Stuhlmanni**, *C. B. Clarke*. Innovations with stellate hairs. Leaves 5 by $1\frac{3}{4}$ in., soon glabrate, except the midrib beneath; petiole up to $\frac{3}{4}$ in. long. Racemes terminal, short, few-flowered; bracts $\frac{1}{2}$ – $\frac{3}{4}$ in. long, lanceolate, green; bracteoles $\frac{1}{3}$ in. long, round-elliptic, short, acuminate, whitish. Calyx $\frac{2}{3}$ –1 in. long; segments 5, linear-ligulate, glandular-hairy. Corolla purple-violet (*Lindau*); tube $\frac{3}{4}$ –1 in. long, inflated in its upper half. Anther-cells in upper half with very long 1-celled white hairs. Style sparsely hairy; ovary conical at the top, passing continuously into the style.—*Stylarthropus Stuhlmanni*, *Lindau* in *Engl. Jahrb.* xx. 11, in *Engl. & Prantl, Pflanzenfam.* iv. 3B. 306, and in *Engl. Pfl. Ost-Afr.* C. 367.

South Central. Congo Free State: Isango River, *Stuhlmann*, 2963! Lualaba River, *Pogge*, 1144!

Mozamb. Dist. German East Africa: Kilimanjaro, *Volkens*, 2396! Usambara, *Holst*, 2673! 3297! *Heinsen*, 17!

Imperfectly known species.

10. **W. Laurentii**, *C. B. Clarke*. Leaves up to 8 by 4 in., ovate, acuminate at either end, glabrous. Panicle compounded of racemes; bracts $\frac{1}{8}$ in. long, filiform; bracteoles $\frac{1}{3}$ in. long, ovate, glabrous. Sepals $\frac{2}{3}$ in. long, glutinous-pubescent. Corolla-tube $1\frac{1}{5}$ in. long; lobes $\frac{1}{5}$ in. long.—*Stylarthropus Laurentii*, *Lindau* in *Engl. Jahrb.* xxiv. 317; *Wild. & Dur. Ill. Fl. Congo*, i. t. 32, p. 65, sub t. 33 and p. 64, "explication," sub t. 32.

South Central. Congo Free State: Upper Congo at Stanley Falls, *Laurent*.

In the text of Wildeman & Durand there are several apparent errors—*e.g.* "stamens 5," while the cross section of the ovary is not that of any Acanthaceous plant.

19. **SATANOCRATER**, Schweinf.; Benth. et Hook. f. *Gen. Pl.* ii. 1085.

Calyx tubular, inflated, 5-angular, shortly 5-toothed. Corolla large, blue; tube inflated in the upper half; lobes 5, subequal, rounded, contorted in bud. Stamens 4; anther-cells 2, muticous; pollen strongly honeycombed. Ovary with 2 ovules in each cell; style-branches one linear, the other suppressed. Capsule oblong, 4-seeded; seeds discoid.—Shrubs 2 ft. high. Leaves entire. Flowers solitary, opposite in the leaf-axils; pedicels 0– $\frac{1}{5}$ in.; bract 0; bracteoles very small, linear.

Corolla-tube $1\frac{1}{2}$ –2 in. long 1. *S. fellatensis*.
Corolla-tube $\frac{3}{4}$ in. long 2. *S. somalensis*.

1. **S. fellatensis**, *Schweinf. in Verh. Zool. Bot. Gesell. Wien*, xviii. 676. Pubescent. Leaves 3 by 1 – $1\frac{1}{4}$ in., elliptic or broad-lanceolate, narrowed at both ends; petiole up to $\frac{1}{4}$ in. long. Bracteoles $\frac{1}{5}$ in. long, linear. Calyx 1 by $\frac{1}{7}$ in.; segments united $\frac{3}{4}$ their length; teeth lanceo-

late, aristate. Corolla-tube $1\frac{1}{2}$ –2 in. long; lobes $\frac{1}{2}$ in. long.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 306, fig. 111, G. *S. Ruspolii*, Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 305. *Ruellia Ruspolii*, Lindau in Ann. Istit. Bot. Roma, vi. 69; Schweinf. & Volk. Liste Pl. Somalis, 16.

Nile Land. Galabat: near the village of Fellata, *Schweinfurth*, 130B! Somaliland: Milmil, *Riva*, 1068! Jocorsa, *Riva*, 1554! Ogaden, *Robecchi*. 245, 248.

Seeds very unripe. The sepals are, as in several species of *Dyschoriste*, united into a tube by a scarious membrane one cell thick, which disrupts at a touch when the fruit is formed. Botanists who have boiled the calyx or applied a reagent find it 5-sepalous nearly or quite to the base.

2. **S. somalensis**, Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 305. Corolla-tube $\frac{3}{4}$ in. long. Ovules 2 in each cell.—*S. paradoxa*, Lindau in Engl. & Prantl, Pflanzenfam. iv. Nachtr. zu ii.–iv. 305. *Ruellia somalensis*, Lindau in Engl. Jahrb. xx. 14, and in Engl. & Prantl, Pflanzenfam. iv. 3B. 309. *Ruellia paradoxa*, Lindau in Ann. Istit. Bot. Roma vi. 69; Schweinf. & Volk. Liste Pl. Somalis, 15.

Nile Land. Somaliland: Ahl Mountains, 3300 ft., *Hildebrandt*, 857A! Jacorsa, *Riva*, 420!

I do not feel sure that this is other than *S. fellatensis*, with the corolla-tube not yet fully elongated.

20. LANKESTERIA, Lindl.; Benth. et Hook. f. Gen. Pl. ii. 1083.

Calyx divided nearly to the base; segments 5, subequal, linear. Corolla (in African species) orange, withering off dull red; tube long, linear, hardly dilated even at the top; lobes 5, subequal, obovate, more or less oblique, contorted in bud. Stamens 2, with 2 small rudiments often added; anther-cells mucicous; pollen short, ellipsoid, reticulated; stopples 3. Ovary glabrous or nearly so, covered with discoid glands; ovules 2 or 1 in each cell; style thinly hairy; stigma capitate or short-oblong, more or less 2-lobed. Capsule 2-seeded (where seen), ellipsoid, flattened, base contracted, solid; seeds covered by hygroscopic hair.—Shrubs 1–3 ft. high. Leaves entire. Flowers in subglobose heads, or in long strobilate spikes or panicles; bract long, ovate or linear; bracteole linear, hardly as long as the calyx.

Species 3–4 in Africa, 17 in Asia (*Dædalacanthus*, T. Anders.). This genus is that part of *Eranthemum*, Linn., separated off generically by R. Brown, and superficially so resembles *Eranthemum* that it was retained in *Eranthemum* by Nees. It is distinguished 1stly by the contorted corolla-lobes, 2ndly by the reticulated pollen, 3rdly by the hygroscopic hairs on the seeds. *Dædalacanthus* is said by Bentham to differ from *Lankesteria* by having included stamens; but in *Dædalacanthus splendens*, T. Anders., the anthers are exerted $\frac{1}{2}$ – $\frac{3}{4}$ in., very much more exerted than in any *Lankesteria*. Lindau separates these genera by the pollen, which he says is round in *Dædalacanthus*, 3-winged in *Lankesteria*. But in the type species, *L. parviflora*, the pollen is only slightly trigonous.

- Flowers in dense compound subglobose heads . . . 1. *L. parviflora*.
 Flowers in strobilate linear-oblong spikes or panicles . . .
 Spike; calyx $\frac{1}{4}$ in. long 2. *L. elegans*.
 Panicle linear; calyx $\frac{1}{3}$ – $\frac{1}{2}$ in. long 3. *L. Barteri*.

1. **L. parviflora**, *Lindl. in Bot. Reg.* 1845, *Misc.* 86, & 1846, *t.* 12. Stem and leaves pubescent, ultimately glabrous. Leaves up to $4\frac{1}{2}$ by $1\frac{1}{2}$ in., tapering at both ends; petiole hardly any. Heads ovoid, up to 1 in. diam., dense; lateral heads distant, smaller, sometimes few-flowered; bract $\frac{3}{4}$ by $\frac{1}{16}$ in. Sepals $\frac{3}{4}$ –1 in. long, ciliate hairy. Corolla yellow or whitish; tube $1\frac{1}{4}$ in. long; lobes obovate, $\frac{1}{3}$ in. long. Filaments exerted $\frac{1}{2}$ – $\frac{1}{8}$ in. Capsule $\frac{1}{3}$ in. long, 2-seeded, covered with glandular discs.—*L. longiflora*, *Lindl. in Bot. Reg.* 1846, sub *t.* 12. *L. hispida*, *T. Anders. in Journ. Linn. Soc.* vii. 32; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3B. 311. *Justicia hispida*, *Willd. Sp. Pl.* i. 84. *Eranthemum hispidum*, *Nees in DC. Prod.* xi. 456.

Lower Guinea. Sierra Leone: Leicester, below the waterfall, *Barter!* in woods, near Wallia, *Scott-Elliott*, 4452! and without precise locality, *Don!* *Smeathman!* *Afzelius!*

2. **L. elegans**, *T. Anders. in Journ. Linn. Soc.* vii. 33, partly. Stem and mature leaves glabrescent. Leaves 5–9 by $2\frac{1}{4}$ in., elliptic, acuminate at both ends; petiole $\frac{1}{8}$ – $\frac{1}{2}$ in. long. Spike terminal (or 2–8 subterminal), 3 – $7\frac{1}{2}$ by 1 in., strobiliform; bracts laxly overlapping, $\frac{3}{4}$ –1 by $\frac{1}{2}$ in., acute, shining glabrous, minutely pubescent near the margin; bracteoles shorter than the calyx, linear. Sepals $\frac{1}{4}$ in. long, softly and minutely hairy, not ciliate. Corolla orange, withering dull reddish; tube $1\frac{1}{2}$ by scarcely $\frac{1}{16}$ in.; lobes nearly $\frac{1}{2}$ in. long, obovate. Ovary glabrous (or with a few minute hairs near the top), covered to the base with discoid glands, 4-ovulate.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3B. 311, and in *Engl. Pfl. Ost-Afr.* C. 368; *Cummins in Kew Bulletin*, 1898, p. 77. *Justicia elegans*, *Beauv. Fl. Owar.* i. 84, *t.* 50. *Eranthemum elegans*, *Roem. et Schultes, Syst.* i. 174; *Nees in DC. Prod.* xi. 447.

Upper Guinea. Gold Coast, *Burton & Cameron!* Ashanti: Assin-Yan-Coomassie, *Cummins*, 50! 199! Lagos: Ajilete, *Millen*, 103! Otta, *Rowland!* and without precise locality, *Moloney*, 6! *Millen*, 120! Cameroons: Bipinde, *Zenker*, 909! Yaunde, *Zenker*, 436! 518! *Zenker & Staudt*, 218! Victoria, *Preuss!*

Lower Guinea. Corisco Bay, *Mann*, 1861!

3. **L. Barteri**, *Hook. f. Bot. Mag. t.* 5533. Stem and mature leaves somewhat pubescent. Leaves up to 7 by $2\frac{1}{2}$ in., acuminate at both ends; petiole 0– $\frac{1}{4}$ in. long. Linear panicles terminal (or 2–8 subterminal), 3–5 by 1 in.; floral leaves $\frac{3}{4}$ by $\frac{1}{3}$ in., acute, overlapping, each covering 2–4 flowers; bract (to each flower) $\frac{1}{2}$ in. long, linear; bracteoles 2, $\frac{1}{3}$ in. long, linear. Sepals $\frac{1}{3}$ – $\frac{1}{2}$ in. long, linear, with terete needle-like points. Flowers nearly as of *L. elegans*.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3B. 311, *fig.* 123, D–G; in *Engl.*

Jahrb. xviii. 63, t. 1, fig. 22, and in Engl. Pfl. Ost-Afr. C. 368. *L. elegans*, T. Anders. in Journ. Linn. Soc. vii. 33 partly.

Upper Guinea. Lagos: Abeokuta, in forest, *Barter*, 3381! Old Calabar, *Robb! Mann*, 2313! *Thomson*, 20! Cross River, *Johnston!*

South Central. Congo Free State: Kinyawanga, west of Ruwenzori, 3000 ft., ex *Lindau*.

Corolla noted by Barter "deep orange sometimes red." This species is so like *L. elegans* that T. Anderson has inscribed Barter, 3381, as *L. elegans*, T. Anders., though it is typical *L. Barteri*. The "bracts" in *L. elegans* are homologous with the floral leaves in *L. Barteri*, and similar to them; the inflorescence of *L. elegans* might be theoretically called a linear panicle, the cyme under each floral leaf being reduced to a single flower with 2 bracteoles.

21. DYSCHORISTE, Nees in Wall. Pl. As. Rar. iii. p. 75.

Calyx segments 5, acute, subequal, often aristate. Corolla $\frac{1}{3}$ –2 in. long, blueish-red, pink, yellow, or white; segments 5, contorted in bud, subequal, more or less in 2 lips; tube very variable, lower linear-cylindric portion from $\frac{1}{8}$ – $1\frac{1}{4}$ in. long, upper portion inflated. Stamens 4, subsimilar; anthers 2, pointed or spurred at the base (except in *D. mutica* and *D. nudanthera*); pollen round or roundish-ellipsoid with several longitudinal ribs. Style hairy; one stigmatic arm linear-oblong, the other suppressed; ovary with 2 ovules in each cell. Capsule linear-cylindric, hardly clavate, solid at the base, always perfecting 4 seeds. Seeds ovoid, much flattened, densely clothed with white hygroscopic hairs.—Small shrubs. Leaves entire, or obscurely crenate. Flowers mostly axillary, solitary or clustered in small condensed, rarely lax, cymes. Bracteoles 2, less than $\frac{1}{2}$ the length of the calyx, linear or narrow-oblong.—*Calophanes*, D. Don; Benth. et Hook. f. Gen. Pl. ii. 1077.

Species 60, in the warm parts of both Hemispheres.

Corolla $\frac{1}{3}$ – $\frac{1}{2}$ in. long or scarcely more.

Anther-cells tailed at the base.

Leaves hardly exceeding 1 in. in length.

Nearly glabrous, except innovations.

Branches suberect; calyx nearly glabrous within

1. *D. depressa*.

Branches procumbent, rooting; calyx hairy within

3. *D. radicans*.

Stem and mature leaves more or less hairy (see also 3. *D. radicans*).

Crisped hairy; calyx divided less than half-way down

5. *D. tubicalyx*.

Sparingly hairy; calyx divided more than half-way down

6. *D. cunenensis*.

Leaves attaining $1\frac{3}{4}$ – $3\frac{1}{2}$ in. in length.

Nearly glabrous, except the innovations; leaves up to $3\frac{1}{2}$ in. long

2. *D. Perrotletii*.

More or less hairy; leaves attaining $1\frac{3}{4}$ –2 in. in length.

- Branches hairy; calyx divided more than half-way down 7. *D. multicaulis*.
- Branches sparsely hairy; calyx divided less than half-way down 8. *D. nobilior*.
- Anther-cells rounded at the base.
- Small erect nearly glabrous annual 4. *D. mutica*.
- Scabrous undershrub 9. *D. nudanthera*.
- Corolla $\frac{2}{3}$ -1 in. long; tube inflated upwards so that the linear-cylindric lower portion is not very elongate (see also 15. *D. linifolia*).
- Cymes small, flowers appearing as if in axillary clusters.
- Leaves attaining $1\frac{1}{2}$ -3 in. in length.
- Corolla $\frac{2}{3}$ - $\frac{3}{4}$ in. long; leaves about $1\frac{1}{2}$ in. long.
- Lower leaves hairy 10. *D. trichocalyx*.
- Lower leaves glabrous 11. *D. verticillaris*.
- Corolla 1 in. long; leaves up to 2-3 in. long 14. *D. heudelotiana*.
- Leaves $\frac{1}{4}$ - $\frac{1}{3}$ in. long 13. *D. capricornis*.
- Cymes loose, open, axillary 12. *D. pedicellata*.
- Corolla $\frac{3}{4}$ -2 in. long; tube linear, funnel-shaped near the top.
- Anthers tailed at the base.
- Corolla less than 2 in. long.
- Leaves exceeding 1 in. in length.
- Corolla purple.
- Calyx $\frac{1}{2}$ in. long.
- Villous; calyx divided $\frac{2}{3}$ way down 16. *D. Hildebrandtii*.
- Pubescent; calyx divided $\frac{1}{3}$ way down 18. *D. Volkensii*.
- Calyx $\frac{3}{4}$ in. long.
- Leaves linear-oblong; flowers 1-2 together 15. *D. linifolia*
- Leaves elliptic; cymes axillary 19. *D. mollis*.
- Corolla yellow 17. *D. Fischeri*.
- Leaves $\frac{1}{2}$ - $\frac{2}{3}$ by $\frac{1}{4}$ in. 20. *D. tanganyikensis*.
- Corolla exceeding 2 in. in length 21. *D. thunbergiiflora*.
- Anthers acute or scarcely mucronate at the base 22. *D. somalensis*.

1. **D. depressa**, Nees in Wall. Pl. As. Rar. iii. 81. Shrub small, with erect branches, glabrous; innovations minutely scabrous-hairy. Leaves up to 1 by $\frac{1}{3}$ in. (usually smaller), elliptic, obtuse, entire or obscurely crenate, nerves and cystoliths obscure; petiole $\frac{1}{4}$ - $\frac{1}{3}$ in. long. Flowers sessile, often 3-8, clustered; bracteoles 2, linear-oblong, hardly as long as the calyx-tube. Calyx $\frac{1}{3}$ in. long, divided $\frac{2}{3}$ way down; teeth linear, hispid; tube nearly glabrous within. Corolla $\frac{1}{2}$ in. long, 2-lipped. Capsule $\frac{1}{4}$ - $\frac{1}{2}$ in. long, suberect, glabrous.—Nees in DC. Prod. xi. 106. *Calophanes Nagchana*, Nees in DC. Prod. xi. 109; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 410. *C. crenatus*, Schinz in Bull. Herb. Boiss. iii. 415. *Linostylis ovata*, Sonder in Linnæa, xxiii. 94.

Nile Land. British East Africa: Ukamba, 5000-6000 ft., Scott-Elliot, 6706! Mau, 7000-8000 ft., Scott-Elliot, 6805! Usongora; at the Salt Lake, near Katwe, Scott-Elliot, 7961!

2. **D. Perrottetii**, O. Kuntze, Rev. Gen. 486. Branches 12-18 in. long, erect. Leaves up to $3\frac{1}{2}$ by $\frac{7}{8}$ in., lanceolate, obtuse; nerves often

very prominent. Calyx with prominent cystoliths. Corolla $\frac{1}{3}$ – $\frac{1}{2}$ in. long, obscurely 2-lipped; otherwise as *D. depressa*.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 302, fig. 121, A–C. *Calophanes Perrottetii*, Nees in DC. Prod. xi. 111; T. Anders. in Journ. Linn. Soc. vii. 23; Engl. Hochgebirgsfl. Trop. Afr. 388; *Linostylis fasciculiflora*, Sonder in Linnæa, xxiii. 95; Solms Laub. in Schweinf. Beitr. Fl. Aethiop. 112, 244.

Upper Guinea. Senegal, *Roger*, 136! *Perrottet*, 28! 515! Ouallo, *Leprieur*! Sierra Leone: by the River Scarcies, *Scott-Elliott*, 4534! 4634! Togoland, *Baumann*, 410! Segge Brook, *Buettner*, 351! 738! 410! 361! Lagos, *Millen*, 99! Niger Territory: Borgu; banks of the River Oly, *Barter*, 820!

Nile Land. Upper Senaar: Fazokl, *Kotschy*, 558! Eritrea: Ginda, 3200 ft., *Schweinfurth & Riva*, 2114! Abyssinia, *Schimper*, 156! 947! 1353! British East Africa: Bongo; by the River Tidju (Tudye), *Schweinfurth*, 2663! Mittu; Dimindo, *Schweinfurth*, 2792! Taita, *Hildebrandt*, 2510!

Hardly distinguishable from *D. depressa* (cf. Schinz in Bull. Herb. Boiss. iv. 846); the plant is taller, attaining 3–4 ft., with straight branches and very erect fruit clusters; the main branches have leaves 2 in. and more long; but the branchlets with shorter leaves by themselves might pass for *D. depressa*.

3. ***D. radicans***, *Nees in DC. Prod.* xi. 106. Stems procumbent, branching, rooting, hispid-pubescent at the tips (and throughout in hill examples), with no straight simple branches. Leaves not exceeding 1 in. in length. Calyx-tube hairy within. Corolla scarcely 2-lipped. Capsules spreading; otherwise as *D. depressa*.—A. Rich. Tent. Fl. Abyss. ii. 141; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 302, in Engl. Pfl. Ost-Afr. C. 367, and in Ann. Istit. Bot. Roma vi. 68. *Calophanes radicans*, T. Anders. in Journ. Linn. Soc. vii. 23; T. Thoms. in Speke, Journ. Append. 643; S. Moore in Journ. Bot. 1880, 197 partly; Oliv. in Trans. Linn. Soc. xxix. 126; Engl. Hochgebirgsfl. Trop. Afr. 388. *Chaetacanthus Burchellii*, Lindau in Engl. Pfl. Ost-Afr. C. 367. *Ch. Persoonii*, Lindau MS. in Stuhlmann, Exs. 1347. *Ruellia radicans*, Hochst. ex Rich. Tent. Fl. Abyss. ii. 141.

Nile Land. Eritrea: near Geleb, 5500 ft., *Schweinfurth*, 1127! Habab, 6000 ft., *Hildebrandt*, 456B! Abyssinia: Tigre; near Adowa, *Schimper*, 17! 177! Hamasen, *Steudner*, 1527! 388! and without precise locality, *Schimper*, 521 partly! 875! 1354! Somaliland: between Harr and Surro, *Riva*, 185! British East Africa: Uganda, *Stuhlmann*, 1347! Buddu; at Villa Maria, *Scott-Elliott*, 7467! Lake Nakuro, 6000 ft., *Scott-Elliott*, 6847! Athi Plains, 5000–6000 ft., *Scott-Elliott*, 6553! Ukamba; Machakos, *Scott-Elliott*, 6601! *Gregory*!

Lower Guinea. Angola: Huilla; Lopollo, *Welwitsch*, 5046! Calunda, *Welwitsch*, 5075! Huilla, *Welwitsch*, 5055! Pungo Andongo, *Welwitsch*, 5189!

Mozamb. Dist. German East Africa: Kilimanjaro and Masai Steppe, ex Lindau; Usambara; Kwa Mshuza, *Holst*, 8917! Karagwe, *Speke & Grant*, 436!

The East African material agrees well together, varying a little in degree of hairiness; but its distinctness from *D. depressa* may be doubted.

4. ***D. mutica***, *C. B. Clarke*. Stems 4–8 in. long, not rooting (appearing annual). Leaves $1\frac{1}{4}$ by $\frac{1}{2}$ in., narrow-elliptic. Anthers muticous; otherwise as *D. radicans*, *Nees*.—*Calophanes radicans*, var. *mutica*, S. Moore in Journ. Bot. 1880, 198.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5089! 5094!

5. **D. tubicalyx**, *C. B. Clarke*. Crisped-hairy, woody, branched. Leaves $\frac{1}{2}$ – $\frac{2}{3}$ by $\frac{1}{3}$ in., ovate to elliptic. Flowers axillary, 4–1 together in condensed cymes. Calyx $\frac{1}{3}$ in. long, divided $\frac{1}{3}$ the way down, hairy within and without; cystoliths obscure; otherwise as *D. radicans*.—*Calophanes radicans* (partly), S. Moore in Journ. Bot. 1880, 197.

Lower Guinea. Angola, *Welwitsch*, 5055! Huilla, *Antunes*, 166! 167! Pungo Andongo, *Mechow*, 65! Malange, *Buchner*, 69!

Appears to be an erect, very woody undershrub, in habit unlike *D. radicans*.

6. **D. cunenensis**, *C. B. Clarke*. Sparingly hairy. Leaves up to $1\frac{1}{3}$ by 1 in. (exclusive of petiole $\frac{1}{2}$ in. long), obovate, truncate, narrowed into the petiole. Flowers axillary, 3–2 together or often solitary. Calyx $\frac{1}{3}$ in. long, divided more than $\frac{1}{2}$ way down; tube 5-angular, very sparsely hairy, with numerous large conspicuous cystoliths; otherwise as *D. radicans*.

Lower Guinea. Angola: Mulondo, on the River Cunene, *Newton*!

This has the habit of *D. radicans*, and may be a wet-forest form of it.

7. **D. multicaulis**, *O. Kuntze*, *Rev. Gen.* 486. Branches many, 16 in. long, rather stout, hairy; leaves up to 2 by $\frac{3}{4}$ in. Stamens 4, subsimilar; anthers tailed. Ovary with 2 ovules in each cell. Capsule narrow-cylindric (not clavate), 4-seeded; otherwise as *D. radicans*.—Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3B. 302, and in Engl. Pfl. Ost-Afr. C. 367. *Dipteracanthus dejectus* β , Nees in DC. Prod. xi. 125, partly; A. Rich. Tent. Fl. Abyss, ii. 142. *Calophanes multicaulis*, T. Anders. in Journ. Linn. Soc. vii. 23. *Ruellia multicaulis*, Hochst. ex A. Rich. l.c.

Nile Land. Abyssinia: Tigre; near Adowa, on Mount Sholoda, *Schimper*, 43! and on Mount Semayata, 8400 ft., *Schimper*, 484!

Except by the stouter straighter stems and larger leaves, this hardly differs from *D. radicans*.

8. **D. nobilior**, *C. B. Clarke*. Sparingly shortly hairy, branches $3\frac{1}{2}$ ft. long, stout, straight, little-divided. Leaves $1\frac{3}{4}$ by $\frac{3}{4}$ –1 in. (exclusive of petiole $\frac{1}{4}$ – $\frac{1}{3}$ in. long), slightly crenulate; tip triangular, often subacute. Cymes many, distant, dense, axillary. Calyx nearly $\frac{1}{3}$ in. long, sparingly pubescent, divided less than half-way down; teeth lanceolate, somewhat wide at the base. Corolla less than $\frac{1}{2}$ in. long. Capsules $\frac{2}{5}$ in. long, erect, stouter than those of *D. radicans*; otherwise as *D. radicans*.—*D. Hildebrandtii*, Lindau MS. in Holst, Exs. 3204A.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5107! 5158!

Mozamb. Dist. German East Africa: Usambara; Duga, *Holst*, 3204A!

Welwitsch (5158) has small flowers and cannot be united with *D. Hildebrandtii*, and with this the other examples (without flowers) cited match.

9. **D. nudanthera**, *C. B. Clarke*. Scabrous; branches 8–14 in. Leaves $1\frac{1}{2}$ by $\frac{1}{3}$ in., lanceolate, subacute at both ends, hispid; petiole 0 – $\frac{1}{8}$ in. long. Cymes close, axillary. Calyx $\frac{1}{3}$ in. long, divided about $\frac{1}{2}$ way down; lobes lanceolate, acute, hispid; tube nearly glabrous

within. Corolla $\frac{1}{3}$ in. long, dark purple when dry. Stamens 4, subsimilar; anther-cells equal, very obtuse at both ends; pollen small, ellipsoid, ribbed. Style with one linear stigmatic branch; cells of ovary 2-ovulate.

Mozamb. Dist. British Central Africa: Niomkolo Island, in Lake Tanganyika, *Carson!*

The anthers in this species are altogether like those of a typical *Ruellia*.

10. **D. trichocalyx**, *Lindau in Engl. Pfl. Ost-Afr. C.* 367. Branches 18 in. long, hairy. Lower and middle leaves 2 by $\frac{1}{3}$ in.; elliptic, hairy on both surfaces, cystoliths obscure; petiole $\frac{1}{3}$ in. long. Flowers often 8–15 in densely congested axillary cymes; bracteoles linear, scarcely $\frac{1}{3}$ the length of the calyx. Calyx $\frac{1}{2}$ in. long, divided $\frac{3}{4}$ way down; tube sparsely hairy without, with long white hairs within; teeth long, subulate, with many simple hairs, few glands. Corolla $\frac{2}{3}$ – $\frac{3}{4}$ in. long, purple-red; narrow-cylindric base of tube short; limb somewhat 2-lipped. Stamens 4, subsimilar; anthers oblong, distinctly tailed; pollen longitudinally many ribbed. Style hairy, one stigmatic branch linear, the other suppressed; ovary 4-ovulate. Capsule $\frac{1}{3}$ in. long, narrow-cylindric, 4-seeded; seeds covered with hygroscopic hairs.—*Calophanes trichocalyx*, *Oliv. in Trans. Linn. Soc.* xxix. 126, t. 126. *Hygrophila*, sp. 1, *T. Thoms. in Speke, Journ. Append.* 643.

Mozamb. Dist. German East Africa: Karagwe, *Speke & Grant*, 404! *Scott-Elliot*, 7491! 8124!

11. **D. verticillaris**, *C. B. Clarke*. Branches glabrous except at the tips. Lower and middle leaves glabrous, cystoliths numerous and conspicuous above, below still larger. Calyx very hairy (almost woolly) without, and with numerous glandular hairs; otherwise as *D. trichocalyx*.—*Calophanes verticillaris*, *T. Anders. ex Oliv. in Trans. Linn. Soc.* xxix. 126. *Nomaphila glandulosa*, *Klotzsch in Peters, Reise Mossamb.* 198. *Hygrophila glandulosa*, *Lindau in Engl. Pfl. Ost-Afr. C.* 367.

Mozamb. Dist. German East Africa: Higher Plateau, north of Lake Nyasa, *Thomson!* Portuguese East Africa: Beira, *Braga*, 147! Rios de Sena, *Peters!* British Central Africa: Nyasaland; Tanganyika Plateau at Fort Hill, 3500–4000 ft., *Whyte!* Nyika Mountains, 4000–6000 ft., *Whyte!* between Songwe and Karonga, 1700–2000 ft., *Whyte* 32! between Kondowe and Karonga, 2000–6000 ft., *Whyte*, 379! Masuku Plateau, 6500–7000 ft., *Whyte!* Manganja Hills, *Meller!* Blantyre, *Buchanan*, 74! Zomba and vicinity, 2500–3500 ft. *Whyte!* Mount Chiradzulu, 4000 ft., *Whyte!* and without precise locality, *Buchanan*, 16!

This species is hardly separable from *D. trichocalyx*; the subulate tips to the calyx-teeth are shorter.

12. **D. pedicellata**, *C. B. Clarke*. Pubescent. Leaves $1\frac{1}{2}$ by $\frac{3}{4}$ in., narrow elliptic, pubescent on both surfaces; cystoliths obscure. Cymes axillary, lax, branched; pedicels 0– $\frac{1}{6}$ in. long; bracteoles $\frac{1}{8}$ in. long, linear. Calyx exceeding $\frac{1}{2}$ in. in length, divided rather more than $\frac{1}{2}$ way down, pubescent without, white hairy within; cystoliths obscure. Corolla 1 in. long, purplish-red when dry; linear-cylindric portion of the tube $\frac{1}{3}$ in. long. Stamens, style, ovules, pollen, as of genus. Capsule $\frac{1}{4}$ in. long, 4-seeded.

Upper Guinea. North Bank of the River Gambia, *Ozanne*, 8! Cameroons; 4000 ft., *Passarge*, 121A!

The calyx is often minutely pedicellate above the bracteoles; and there is seen sometimes a shoot from the axil of a bracteole.

13. **D. capricornis**, *C. B. Clarke*. Glandular-pubescent; branchlets woody. Leaves $\frac{1}{4}$ – $\frac{1}{3}$ by $\frac{1}{8}$ – $\frac{1}{5}$ in., obtuse, nearly sessile. Cymes axillary, dense, 3–8-flowered; bracteoles $\frac{1}{10}$ in. long, linear. Calyx $\frac{1}{3}$ in. long, divided less than $\frac{1}{2}$ way down, glandular-pubescent without, white-hairy within; cystoliths hardly prominent; teeth lanceolate, aristate. Corolla $\frac{3}{4}$ in. long; linear-cylindric portion of tube $\frac{1}{4}$ in. long. Stamens, pollen, pistil, ovules, of the genus.

South-West Africa. South lat. 23°, *Chapman & Baines*!

14. **D. heudelotiana**, *O. Kuntze*, *Rev. Gen.* 486. Pubescent and thinly hairy. Leaves up to 3 by $\frac{3}{4}$ –1 in., narrowly elliptic, obtuse, subsessile, puberulous, a few scattered white hairs added. Cymes axillary, small, 3–1-flowered; bracteoles $\frac{1}{8}$ – $\frac{1}{6}$ in. long, linear. Calyx $\frac{1}{2}$ – $\frac{2}{3}$ in. long, divided more than $\frac{1}{2}$ way down, pubescent without, white-hairy within; cystoliths slender. Corolla 1 in. long, purple; linear-cylindric portion of the tube nearly $\frac{1}{2}$ in. long. Stamens, pollen, pistil, ovules, capsule (nearly $\frac{1}{2}$ in. long) as of genus.—*Calophanes heudelotianus*, *Nees* in *DC. Prod.* xi. 112; *T. Anders.* in *Journ. Linn. Soc.* vii. 23.

Upper Guinea. Senegambia, Bondou, *Heudelot*, 18 (ex *Nees*), *Heudelot*, 144! 190! and without precise locality.

15. **D. linifolia**, *C. B. Clarke*. Viscid glandular-hairy; branch 16 in. long. Leaves 1 by $\frac{1}{8}$ – $\frac{1}{4}$ in., narrow elliptic, subsessile, viscid glandular-hairy; cystoliths obscure. Flowers axillary, 2 together or solitary; bracts $\frac{1}{4}$ in. long, linear-oblong. Calyx $\frac{3}{4}$ in. long, divided $\frac{2}{3}$ the way down, glandular-hairy; tube within white-hairy; cystoliths obscure; teeth linear, obtuse. Corolla nearly $1\frac{1}{2}$ in. long, linear-cylindric portion of tube $\frac{2}{3}$ in. long. Stamens, pollen, pistil, as of genus.—*Calophanes linifolius*, *T. Anders.* MS. in *Hb. Kew*.

Mozamb. Dist. British Central Africa: Northern Zambesia; Batoka Highlands, *Kirk*!

16. **D. Hildebrandtii**, *Lindau* in *Engl. & Prantl*, *Pflanzenfam.* iv. 3B. 302. Pubescent, more or less villous; branches 12–16 in. long. Leaves $1\frac{1}{2}$ by $\frac{2}{3}$ in., elliptic, obscurely crenulate; cystoliths not prominent; petioles 0– $\frac{1}{8}$ in. long. Cymes axillary, small, 3–10-flowered; bracteoles less than $\frac{1}{2}$ the length of the calyx, linear. Calyx rather more than $\frac{1}{2}$ in. long, divided $\frac{2}{3}$ the way down; tube scabrous-pubescent without, white hairy within; cystoliths not prominent. Corolla $1\frac{1}{3}$ in. long, purple; linear-cylindric portion of the tube $\frac{3}{4}$ in. long. Stamens and pistil of the genus. Capsule $\frac{1}{2}$ in. long, linear-cylindric, 4-seeded; seeds] covered with hygroscopic hairs.—*Lindau* in *Engl. Pfl. Ost-Afr.* C. 367. *Calophanes Hildebrandtii*, *S. Moore* in *Journ. Bot.* 1880, 8.

Nile Land. British East Africa: Ukamba; Kitui, *Hildebrandt*, 2718!

Mozamb. Dist. German East Africa: Usambara, *Holst*, 3304A!

17. **D. Fischeri**, *Lindau in Engl. Jahrb.* xx. 11. Flowers yellow; otherwise as *D. Hildebrandtii*.—*Lindau in Engl. Pfl. Ost-Afr. C.* 367, and in *Ann. Istit. Bot. Roma*, vi. 68.

Nile Land. Somaliland, Mount Ciaffa, *Riva*, 571!

Mozamb. Dist. German East Africa: Masai Steppe, *Fischer*, 485! Portuguese East Africa: Lower Zambesi; Sena, *Peters*! British Central Africa: North Nyasaland, *Nicholson*!

This plant is hardly distinguishable in the dried state from *D. Hildebrandtii*, but has yellow flowers. The bracteoles are $\frac{1}{8}$ in. long, linear; not $\frac{1}{3}$ in., elliptic, as stated by *Lindau* (of the floral leaves probably).

18. **D. Volkensii**, *C. B. Clarke*. Sparingly pubescent. Leaves up to $1\frac{3}{4}$ by 1 in., elliptic, obscurely crenulate; cystoliths not prominent; petioles $0-\frac{1}{6}$ in. long. Cymes axillary, 3-10-flowered. Calyx rather more than $\frac{1}{2}$ in. long, divided $\frac{1}{3}$ the way down; tube scabrous pubescent without, white hairy within. Corolla $1-1\frac{1}{4}$ in. long, not 2-lipped; lobes 5, subequal, obtuse. Stamens 4; anthers subequal, tailed at the base; pollen longitudinally ribbed. Capsule $\frac{1}{2}$ in. long, linear-cylindric, 4-seeded. Ovary 4-ovuled.—*Hygrophila Volkensii*, *Lindau in Engl. Jahrb.* xix. Beibl. n. 47, 46, and in *Engl. Pfl. Ost-Afr. C.* 366.

Mozamb. Dist. German East Africa: Kilimanjaro, 3300 ft., *Volkens*, 324, 1627!

This plant is hardly distinguishable from *D. Hildebrandtii*. *Lindau* distinguishes it by having the capsule hairy; the young capsules are perfectly glabrous. *Lindau* is in error in saying that the calyx is divided $\frac{2}{3}$ the way down.

19. **D. mollis**, *C. B. Clarke*. Hairy; branches with many long several-celled gland-tipped hairs. Leaves hairy on both faces. Cymes rather lax, pedicels often $\frac{1}{4}$ in. long; bracteoles $\frac{1}{2}$ in. long, linear, a little distant. Calyx up to $\frac{2}{3}-\frac{3}{4}$ in. long, divided half-way down or more, densely covered with long several-celled gland-tipped hairs. Capsule exceeding $\frac{1}{2}$ in. in length; otherwise as *D. Hildebrandtii*.—*D. Hildebrandtii*, var. *mollis*, *S. Moore in Journ. Bot.* 1894, 132. *Blepharis an var. B. Hildebrandtii*, *S. Moore, Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii.* 345.

Nile Land. British East Africa: Kikuyu; Steppes of the Thikathika River, *Gregory*! Taita; Maungu Mountain, 2000 ft., *Johnston*!

Mozamb. Dist. German East Africa: Kilimanjaro; 2000-3000 ft., *Johnson*! Usambara; Mascheua, *Holst*, 8750!

20. **D. tanganyikensis**, *C. B. Clarke*. Ashy-puberulous; branches numerous, hardly 4 in. long, from a very stout rootstock (apparently after being burnt down). Leaves $\frac{1}{2}-\frac{2}{3}$ by $\frac{1}{4}$ in., elliptic, obtuse, narrowed at the base, scarcely petioled. Flowers in numerous few-flowered axillary dense cymes. Calyx $\frac{1}{3}$ in. long, divided more than $\frac{1}{2}$ way down. Corolla $\frac{3}{4}-1$ in. long, purple when dry; linear-cylindric portion of tube

exceeding $\frac{1}{3}$ in. in length. Stamens and pistil of the genus. Capsule $\frac{1}{4}$ – $\frac{1}{3}$ in. long, linear-cylindric.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, *Carson!*

21. **D. thunbergiiflora**, *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3B. 302. A minutely sparsely pubescent branched shrub. Leaves 1 by $\frac{1}{3}$ in., obovate, obtuse, attenuate at the base; petiole 0– $\frac{1}{8}$ in. long. Flowers in axillary, 1–4-flowered, rather lax monopodial cymes; bracteoles small, linear, or 0. Calyx $\frac{2}{3}$ in long, divided half-way down into linear teeth; tube nearly glabrous without, thinly white-hairy within; cystoliths many, prominent. Corolla 1– $2\frac{1}{3}$ in. long, fine purple; linear-cylindric portion of the tube $\frac{3}{4}$ in. long. Stamens and pistil of the genus; anther-tails large. Capsule not seen.—*Lindau in Engl. Pfl. Ost-Afr.* C. 367. *Calophanes thunbergiiflora*, *S. Moore in Journ. Bot.* 1880, 8.

Nile Land. British East Africa: Ukamba; Kitui, *Hildebrandt, 2719!*

22. **D. somalensis**, *Rendle in Journ. Bot.* 1895, 413. Grey pubescent; stems 8–30 in. long, rigid, branched. Leaves $\frac{1}{3}$ – $\frac{2}{3}$ in. long, orbicular or obovate, obtuse; petiole 0– $\frac{1}{10}$ in. long. Flowers axillary, solitary; bracteoles very small, linear. Calyx $\frac{1}{2}$ in. long, divided $\frac{1}{3}$ the way down; teeth linear; tube narrow, nearly glabrous without, white-hairy within; cystoliths many, prominent. Corolla 1– $1\frac{1}{4}$ in. long, purple; linear-cylindric portion of the tube $\frac{3}{4}$ in. long. Pistil and stamens of the genus; anthers acute or mucronate at the base. Capsule $\frac{2}{3}$ in. long, linear-cylindric.—*Phillipsia fruticulosa*, *Rolfe in Kew Bulletin*, 1895, 223; *Hook. Ic. Pl.* t. 2445. *Satanocrater fruticulosa*, *Lindau in Engl. & Prantl, Pflanzenfam.* Nachtr. zu ii.–iv. 305, and in *Engl. Jahrb.* xxiv. 317.

Nile Land. Somaliland: Sheik-Husein, *Donaldson Smith!* Golis Range, *Mrs. Lort Phillips!*

Imperfectly known species.

23. **D. adscendens**, *O. Kuntze, Rev. Gen.* 485. Leaves oblong, obtuse, nearly glabrous. Flowers axillary, clustered or solitary; bracteoles lanceolate, as long as the calyx. Calyx divided $\frac{1}{2}$ way down; teeth setaceous. Corolla funnel-shaped, as long as the calyx or twice as long.—*Calophanes adscendens*, *Hochst. ex Nees in DC. Prod.* xi. 111.

Nile Land. Abyssinia, *Kotschy.*

Not seen. The bracteoles being as long as the calyx show that this can be no plant in the Kew bundles of *Dyschoriste*. As nothing is stated of style, ovules, capsule or seeds, it is not possible to guess in what genus this missing plant is to be sought.

24. **D. hyssopifolia**, *O. Kuntze, Rev. Gen.* 486. Leaves linear, obtuse, very glabrous. Flowers solitary, axillary; bracteoles lanceolate-linear, obtuse, shorter than the bristle-acuminate calyx.—*Calophanes hyssopifolius*, *Nees in DC. Prod.* xi. 111 (not of *Nees in Linnæa* xx. 713), *Ruellia hyssopifolia*, *Hochst. ex Nees, in DC. Prod.* xi. 111.

Nile Land. Abyssinia, *Kotschy*.

Not seen. Said to be allied to *D. adscendens*, a species likewise unknown to late writers.

26. **D. subquadrangularis**, *C. B. Clarke*. Stem 3 ft. high, subquadrangular. Leaves $\frac{4}{5}$ by $\frac{1}{2}$ in., ovate, narrowed at either end, pubescent; petiole $\frac{1}{10}$ in. long, hairy. Inflorescences axillary, cymose, congested, hairy; bracteoles linear, minute. Flowers blue. Calyx $\frac{1}{3}$ in. long, divided half-way down, hairy, glandular. Corolla-tube $\frac{3}{5}$ in. long; lobes $\frac{1}{6}$ in. long. Style hairy. Capsule nearly $\frac{1}{2}$ in. long, 4-seeded.—*Hygrophila subquadrangularis*, Lindau in Engl. Jahrb. xxiv. 314.

Mozamb. Dist. German East Africa: Usambara; 1600 ft., *Buchwald*, 94.

Said to be most nearly allied to *Hygrophila Volkensii*, Lindau (a *Dyschoriste*); and, having only 4 seeds to the capsule, is probably a *Dyschoriste*.

Chaetacanthus, Nees. This genus differs from *Dyschoriste* by having two stamens only; and is South African; no example from Tropical Africa having been seen. In Engl. Pf. Ost-Afr. C. 367, Lindau places in Tropical East Africa two species—viz., *C. setiger* (Stuhlmann, 1347) and *C. Burchellii* (Holst, 8917), both of which prove to have 4 stamens and to be *Dyschoriste radicans*, Nees. There would appear to exist further ground for *Chaetacanthus* occurring in Tropical Africa from Lindau l.c., but none was found at Berlin.

22. DISPERMA, C. B. Clarke.

Calyx small, tubular half its length, or 3 posticous segments nearly free; segments 5, equal, narrow-oblong, or 2 anticous connate nearly to the top. Corolla small, $\frac{1}{2}$ – $\frac{3}{4}$ in. long; tube narrowly funnel-shaped from the base or subcylindric; lobes 5, subequal, ovate, contorted in bud. Stamens 4, subsimilar; anther-cells linear-oblong, parallel, rounded at the base; pollen short-ellipsoid, ribbed. Ovary with 1 (sometimes 2) ovule in each cell; style with 2 linear-oblong (often unequal) branches. Capsule small, 2-seeded, obovoid-ellipsoid, much flattened, woody, brown, shining; seeds discoid, with many hygroscopic hairs on the margin.—Small or medium-sized shrubs, more or less hairy. Leaves entire, crenate, or toothed. Clusters of flowers axillary; bract oblong, about as long as the calyx; bracteoles similar, smaller.

Species, the 7 following, endemic in Tropical Africa.

The character which holds these 7 species closely together is the flattened ellipsoid capsule, which is quite different from the capsule of *Dyschoriste*, when by accident 2 seeds only are perfected. There is one ovule in each cell with frequently a lower imperfect one added; as in species of *Barleria*. The genus *Lamiacanthus*, O. Kuntze founded on a Javan plant, may prove hereafter to include *Disperma*, but its capsule is unknown.

Erect; corolla $\frac{3}{4}$ in. long.

Calyx subequally 5-fid about $\frac{1}{2}$ -way down . . . 1. *D. kilimandscharicum*.

Calyx 2-anticous segments connate $\frac{3}{4}$ their length,
3 posticous segments free,

- Leaves 1-1 $\frac{3}{4}$ in. long 2. *D. quadrisepalum*.
 Leaves up to 4 in. long 3. *D. parviflorum*.
 Large, semiscandent; corolla $\frac{2}{3}$ in. long.
 Inflorescences elongate, oblong, quasi-terminal.
 Leaves up to 8 in. long, entire 4. *D. quadrangulare*.
 Leaves up to 3 $\frac{1}{2}$ in. long, crenate-dentate 5. *D. dentatum*.
 Leaves up to 1 $\frac{1}{2}$ in. long, entire, oblong, densely
 woolly 6. *D. angolense*.
 Inflorescences short, dense, quasi-lateral 7. *D. densiflorum*.

1. **D. kilimandscharicum**, *C. B. Clarke*. Pubescent small shrub. Leaves $\frac{3}{4}$ -1 by $\frac{1}{2}$ in., obovate, obtuse, toothed, microscopically densely dotted, cystoliths obscure; petiole hardly any. Flowers clustered, in axillary small cymes; bracteoles lanceolate, $\frac{1}{2}$ the length of the calyx. Calyx $\frac{1}{4}$ in. long, divided $\frac{1}{2}$ way down, with many cystoliths; tube nearly glabrous within, short-pubescent without; teeth narrowly linear-lanceolate. Corolla $\frac{1}{3}$ in. long, somewhat 2-lipped; lobes contorted in bud, obtuse, hairy without, with many long deflexed hairs in the throat. Stamens 4; filaments with long white hairs below, and a few stalked glands upwards; anthers equal, similar, base not apiculate; pollen round-ellipsoid, longitudinally several-ribbed. Ovary glabrous; style hairy, with 2 linear unequal stigmatic branches; ovule 1 in each cell. Capsule $\frac{1}{5}$ in. long, obovoid-ellipsoid, much flattened, hard brown, shining. Seeds 2, round, flattened, on large retinacula, covered with tufted long hairs, which spring out elastically on being wetted.—*Dyschoriste kilimandscharica*, Lindau in Engl. Pfl. Ost-Afr. C. 367, and in Engl. Jahrb. xxiv. 315.

Mozamb. Dist. German East Africa: Kilimanjaro, 3000 ft., *Volkens*, 1721!

Var. β *bracteolata*, *C. B. Clarke*. Bracteoles as long as calyx narrowly oblong. Flowers in denser clusters. Calyx more hairy.

Nile Land. British East Africa: Ukamba, *Scott-Elliot*, 6306 partly!

The other part of *Scott-Elliot*, 6306, is *Justicia fruticulosa*, Lindau.

2. **D. quadrisepalum**, *C. B. Clarke*. Pubescent small shrub. Leaves up to 1 $\frac{3}{4}$ by $\frac{3}{4}$ in., narrowed at both ends, more or less strongly crenate-toothed; petiole hardly any. Flowers closely clustered in axillary small cymes; bracteoles linear-lanceolate, as long as the calyx. Calyx exceeding $\frac{1}{4}$ in. in length, 4-fid nearly to the base, 2 anticous segments connate nearly to the tip into 1 obovate-elliptic 2-nerved piece, 3 others nearly equally long. Corolla $\frac{1}{3}$ in. long. Stamens 4, subsimilar; anthers of 2 equal parallel oblong muticous cells; pollen ellipsoid, many-ribbed. Style thinly hairy; branches 2, linear-oblong. Capsule $\frac{1}{5}$ in. long, obovoid, flattened, woody, brown, 2-seeded.—*Hygrophila crenata*, Lindau in Engl. Jahrb. xx. 6, and in Engl. Pfl. Ost-Afr. C. 366.

Mozamb. Dist. German East Africa: Wadiboma, *Fischer*, 495! Usagara; Mpwapwa, *Stuhlmann*, 287! British Central Africa: Rhodesia; Panda-ma-Tenka, *Holub*! Leshumo Valley, *Holub*, 714! 715! Tamasanka, *Holub*, 1212-1214!

From the 4-fid calyx and the 1-ovulate ovary-cells, this species was referred to *Barleria*, sect. *Somalia*. It is very like *D. kilimandscharicum*.

3. **D. parviflorum**, *C. B. Clarke*. Branches 3-4 ft. long, stout, patent hairy. Leaves $3\frac{1}{2}$ by $1\frac{1}{2}$ in., narrowed at both ends, sparsely hairy, coarsely crenate; petiole $0-\frac{1}{4}$ in. long. Flower-clusters axillary, very dense; bract small, shorter than the calyx. Calyx scarcely $\frac{1}{5}$ in. long, 2 anticous segments connate $\frac{3}{4}$ their length, 3 others connate scarcely $\frac{1}{4}$ their length. Corolla-tube $\frac{1}{5}$ in. long, mouth small; anthers muticous, pollen of *Disperma*. Ovary with 2 ovules in each cell; style nearly glabrous, branches linear, unequal. Capsule scarcely $\frac{1}{5}$ in. long, stalked, ellipsoid, flattened, 2-seeded, shining brown.—*Hygrophila parviflora*, Lindau in Engl. Jahrb. xx. 7, and in Engl. Pfl. Ost-Afr. C. 366.

Mozamb. Dist. British Central Africa: Nyasaland, *Buchanan*, 556 partly!

Buchanan 556 is a mixture, and the sheets have been issued mixed! The description of Lindau of his *Hygrophila parviflora* (calyx $\frac{1}{3}$ in. long) applies mainly to the present species. The other plant mixed under Buchanan 556 is a *Dyschoriste*, with calyx $\frac{3}{4}$ in. long, near or perhaps *D. trichocalyx*.

4. **D. quadrangulare**, *C. B. Clarke*. Large, subscandent; branches sharply quadrangular. Leaves up to 8 by $3\frac{1}{4}$ in., spathulate-elliptic, hardly petioled, thin in texture, very sparsely hairy, cystoliths obscure; margin entire, obscurely wavy. Inflorescence in viscid-hairy axillary panicles 3-6 in. long, but (by the falling of the floral leaves) apparently a terminal panicle 14 by 8 in.; bract $\frac{1}{3}$ in. long, oblong; bracteoles similar, rather smaller. Calyx $\frac{1}{2}$ in. long, divided $\frac{1}{3}-\frac{1}{2}$ the way down, more or less viscid-hairy; teeth narrow-lanceolate. Corolla $\frac{2}{3}$ in. long (linear-cylindric portion $\frac{1}{3}$ in. long), purple with brown transverse marks and strong deflexed simple hairs in the throat. Stamens, anthers, pollen, pistil, stigmas, and ovules as of *D. kilimandscharicum*. Capsule (and seeds) as of *D. kilimandscharicum*, but a little larger, $\frac{1}{4}$ in. long.—*Nomaphila quadrangularis*, Klotzsch in Peters, Reise Mozamb. 197. *Hygrophila quadrangularis*, Lindau in Engl. Pfl. Ost-Afr. C. 367 partly.

Mozamb. Dist. German East Africa: Bibisande, *Stuhlmann*, 409! Usukuma; Usiha, *Fischer*, 493! Portuguese East Africa: Rios de Sena, *Peters*, 8! British Central Africa: Nyasaland; Katunga, on the River Shire, *Scott*!

This fine plant has all the appearance of one of the large rambling Indian *Strobilanthes*: except by the number of ovules it might be placed in that genus. Klotzsch has misled everybody by printing that the cells of the ovary are *vieleiig* (many-ovuled) instead of *viereiig* (4-ovuled).

5. **D. dentatum**, *C. B. Clarke*. Leaves up to $3\frac{1}{2}$ by $1\frac{1}{4}$ in., distinctly regularly crenate-toothed; otherwise nearly as *D. quadrangulare*.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; Shiramba, *Kirk*! British Central Africa: Nyasaland; Monkey Bay, Lake Nyasa, 1600 ft., *Whyte*!

The inflorescence is more viscid-hairy than that of *D. quadrangulare*; the leaves have stronger nerves raised beneath; and the toothing of the margin consists of forward-pointed white teeth each ending in a minute point. In *D. quadrangulare*, the margins of the leaves are very entire and obscurely wavy. The calyx, corolla, stamens, and pistil are like those of *D. quadrangulare*.

6. **D. angolense**, *C. B. Clarke*. Leaves up to $1\frac{1}{4}$ by $\frac{1}{3}$ in. (mostly smaller), entire, narrowly obovate-oblong, sessile, densely minutely

softly hairy. Inflorescence of numerous axillary approximate short few-flowered cymes, running into apparently paniced spikes, with soft hairs and many-celled gland-tipped hairs, almost viscid. Calyx divided about $\frac{1}{2}$ the way down, somewhat 2-lipped. Corolla $\frac{2}{3}$ in. long. Stamens 4, subsimilar; anthers narrow-oblong, obtuse at the base, pollen short-ellipsoid, 8–12-ribbed. Style hairy; branches 2, oblong, slightly unequal, ovary glabrous. Capsule $\frac{1}{3}$ in. long, of the genus.

Lower Guinea. Angola: Huilla; Humpata, *Johnston!* Cunene River, *Johnston!*

7. ***D. densiflorum***, *C. B. Clarke*. Pubescent; branches stout, terete, with raised lines. Leaves 2 by $1\frac{1}{2}$ in., ovate, crenate; petiole up to $\frac{1}{3}$ in. long. Cymes axillary, compound, 10–30-flowered, near together; bracteoles $\frac{1}{3}$ in. long. Calyx $\frac{1}{3}$ in. long, divided $\frac{1}{3}$ the way down; teeth lanceolate, minutely pubescent. Corolla $\frac{3}{4}$ in. long; lobes subequal, short. Stamens 4, subequal; anthers not tailed; pollen longitudinally ribbed. Style-branches 2, linear-oblong, slightly unequal. Capsule $\frac{1}{5}$ in. long, 2-seeded; seeds covered with hygroscopic hairs.

East Tropical Africa. Without locality, *Scott-Elliot!*

23. PHAYLOPSIS, Willd.; Benth. et Hook. f. Gen. Pl. ii. 1081.

Calyx 5-fid nearly to the base; 2 anticous segments oblong or linear, posticous segment ovate or elliptic, 2 inner segments shorter, linear. Corolla small; tube $\frac{1}{4}$ in. long or less, inflated upwards (except in *P. lankesterioides* and *P. glandulosa*); lobes 5, contorted, nearly equal, but forming 2 lips. Stamens 4; anther-cells at the base minutely apiculate or muticous; pollen short-ellipsoid, longitudinally 12-ribbed, with 3 stopples. Style thinly hairy; one stigmatic arm linear-oblong, the other very short; ovary with 2 ovules in each cell, glandular at the top, often also hairy or glandular nearly to the base. Capsule elliptic, compressed, solid at the base, 4-seeded, margins very stout, solid, faces becoming scarious and breaking up; capsule dehiscing with elasticity, the placentæ (carrying the seeds) separate and spring up from the bottom; margins of seeds with numerous hygroscopic hairs.—Small, shrubby. Leaves often very oblique, those in one opposite pair unequal, elliptic, entire or crenate. Inflorescence in cylindric or ovoid spikes, the broad floral leaves enclosing a contracted cyme of usually 3 flowers; bract and bracteoles 0.

Species 15, in Africa, Mascarene Islands, India.

Petalidum differs from *Phaylopsis* little but by having 2 large bracteoles to each flower.

Willdenow constituted the genus *Phaylopsis* in 1800. Bentham (in Benth. et Hook. f. Gen. Pl. ii. 1081), states that the genus is equal to *Micranthus*, Wendl. published in 1798, but as the name *Micranthus*, Ecklon, had been for fifty years used for a genus of *Irideæ*, Bentham exercised his discretion by continuing the name *Phaylopsis*, though *Micranthus* had two years priority. In 1891, O. Kuntze revived *Micranthus*, Wendl., after it had slept for ninety-three years.

Corolla-tube less than $\frac{1}{2}$ in. long, somewhat funnel-shaped upwards.

Inflorescences strobilate, many, cylindric.

- Anticous 2 calyx-teeth linear-ligulate, acute . . . 1. *P. parviflora*.
 Anticous 2 calyx-teeth linear-spathulate . . . 2. *P. longifolia*.
 Anticous 2 calyx-teeth oblong-falcate . . . 3. *P. falcisepala*.

Inflorescences short-cylindric, hardly strobilate.

- Bracts hardly so long as flowers . . . 4. *P. angolana*.
 Bracts longer than flowers; spike leafy . . . 5. *P. Poggei*.

Inflorescences ovoid, not strobilate.

Heads of flowers scattered.

Leaves less than 1 in. long, subentire, glabrescent . . . 6. *P. microphylla*.

Leaves up to 3 in. long, oblique, entire, pubescent . . . 7. *P. micrantha*.

Spikes very small, leaves crenate-serrate . . . 8. *P. obliqua*.

Leaves and inflorescences subterminal on lateral branchlets . . . 9. *P. Johnstoni*.

Corolla-tube $\frac{1}{3}$ in. long, subcampanulate in the upper part . . . 10. *P. Barteri*.

Corolla-tube $\frac{4}{5}$ in. long or more, linear to the top.

Leaves ovate; bracts round; corolla-tube $\frac{4}{5}$ in. long . . . 11. *P. lankesterioides*.

Leaves lanceolate; bracts narrow; corolla-tube, 1 in. long . . . 12. *P. glandulosa*.

1. ***P. parviflora***, Willd. *Sp. Pl.* iii. 342. Stem 1–2 ft. high, branched, decumbent or suberect, hairy, becoming glabrescent below. Leaves up to 3 by $1\frac{1}{2}$ in. (many on the same stem only $\frac{1}{2}$ –1 in.) long, those of one pair sometimes very unequal, acuminate at both ends, pubescent, some often very unequal and oblique at the base, nearly entire; petiole up to $1\frac{1}{2}$ in. long. Inflorescences some cylindric up to $2\frac{1}{2}$ by $\frac{2}{3}$ in., dense, strobilate (some examples have nearly all the inflorescences ovoid); lower floral leaves $\frac{1}{3}$ by $\frac{1}{2}$ in., rounded subtruncate; upper floral leaves of the same inflorescence are $\frac{1}{2}$ by $\frac{1}{3}$ in., ovate, triangular, subacute at the tip. Calyx $\frac{1}{4}$ – $\frac{1}{3}$ in. long, hairy, scarcely glandular; posticous segment ovate, two anticous segments narrowly linear-ligulate, not dilated at the subacute tip. Corolla $\frac{1}{3}$ in. long, white or purplish; tube cylindric, narrow-funnel-shaped at the top. Ovary glabrous, sparingly glandular close to the top only. Capsule $\frac{1}{6}$ – $\frac{1}{4}$ in. long.—T. Anders. in Journ. Linn. Soc. vii. 26; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 417. *P. longifolia*, Sims, Bot. Mag. t. 2433. *Ruellia imbricata*, Forsk. Descr. Ægypt.-Arab. 113; Vahl, Symb. ii. 73. *Micranthus oppositifolius*, Wendl. Bot. Beobacht. 39; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 298, and in Engl. Pfl. Ost-Afr. C. 367. *M. longifolius* & *M. imbricatus*, O. Kuntze, Rev. Gen. 493. *Ætheilema imbricatum*, R. Br. Prod. 478; Benth. in Hook. Niger Fl. 480; Nees in DC. Prod. xi. 262 partly; not of A. Rich. *Æ. reniforme*, Nees in Wall. Pl. As. Rar. iii. 94, and in DC. Prod. xi. 261; Wight, Ic. t. 1533; Benth. in Hook. Niger Fl. 480. *Phaulopsis oppositifolius* & *P. longifolius*, Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 305.

Upper Guinea. Senegal, Perrottet, 631! Senegambia, Heudelot, 585! Gambia, Brown-Lester, 11! Sierra Leone, Afzelius! Smeathman! Don! Scott-Elliot, 5693! 4426!

Nile Land. Abyssinia: Eritrea; Saganeiti, 6500 ft., *Schweinfurth & Riva*, 939!

Mozamb. Dist. Pemba Island (ex *Lindau*). German East Africa: Usambara, *Holst*, 31A! British Central Africa: Nyasaland, Mount Chiradzulu, 4000 ft., *Whyte*! and without precise locality, *Buchanan*, 773!

I differ from *Lindau* in ascribing the synonyms above given to this plant. The *Ruellia imbricata* of Forskål is in the British Museum, and is the Indian *Phayloopsis parviflora* as R. Brown made it. The *Phayloopsis longifolia*, Sims (Bot. Mag. t. 2433) is figured from a Sierra Leone piece (where *Ph. longifolia*, T. Thoms. is not known), and agrees perfectly with the Sierra Leone plants of Heudelot and others.

2. ***P. longifolia***, *T. Thoms. in Speke, Journ. Append.* 643, not of Sims. Two anticous calyx-segments linear-spathulate, obtuse, about as long as the posticous segment; otherwise as *P. parviflora*.—T. Anders. in Journ. Linn. Soc. vii. 26; Oliver in Trans. Linn. Soc. xxix. 127, ser. 2, Bot. ii. 345; Engl. Hochgebirgsfl. Trop. Afr. 388. *Ætheilema imbricatum*, A. Rich. Tent. Fl. Abyss. ii. 149; Solms Laub. in Schweinf. Beitr. Fl. Aethiop. 104. *Barleria inæqualis*, Hochst. MS. in Schimper Exs. 367. *Micranthus longifolius*, *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3B. 298, fig. 120 A-F, in Engl. Pfl. Ost-Afr. C. 367 partly, and in Ann. Istit. Bot. Roma vi. 68, not of O. Kuntze.

Upper Guinea. Cameroons: Bipindi, 300 ft., *Zenker*, 1215! Victoria, *Staudt*, 663!

Nile Land. Eritrea: Ginda, 3300 ft., *Schweinfurth & Riva*, 2138! Abyssinia: Tigre; Addi-Dschoa, 7500 ft., *Schimper*, 542! Ferfera River, *Schimper*, 733! Mount Sholoda, *Schimper*, 367! Mountains near Axum, *Schimper*, 1523! Dochli, *Schimper*, 505! Samen; Aman-Eski, 6000–7000 ft., *Schimper*, 339! Somaliland: Harar, *Robecchi*, 5! British East Africa: Madi; rocky heights of Ugani, *Speke & Grant*! east side of Lake Albert Edward, *Scott-Elliott*, 8086!

Mozamb. Dist. German East Africa: Kilimanjaro, 6000 ft., *Volkens*, 758! *Johnston*, 96! Usambara, *Holst*, 676B! 8333! 8911! Uluguru, *Stuhlmann*, 8875! 9240! Portuguese East Africa: Beira, *Braga*, 82! 84!

The plants here taken as typical of this species are *Schimper's* Abyssinian specimens. The above citations of authors refer to the plant they meant, not to their synonymy, which is largely erroneous. In *Schimper*, 367, the leaves are not so long nor so oblique at the base as commonly in *P. parviflora*; in *Holst*, 8911 (*Lindau's longifolia*), the leaves are small 1–1 $\frac{3}{4}$ in. long. The present species might be treated as a var. of *P. parviflora*.

3. ***P. falcisepala***, *C. B. Clarke*. Two anticous calyx-segments oblong-falcate, hispid-ciliate, black towards the base, their adjacent margins straight, very close together; otherwise as *P. parviflora*.—*Micranthus longifolius*, *Lindau in Engl. Pfl. Ost-Afr. C.* 367 partly.

Upper Guinea. Sierra Leone, *Don! Smeathman! Brown & Brown*, 35! *Scott-Elliott*, 3993! Lagos: Yoruba, *Millson*, 127! Niger Territory: Nupe, *Barter*, 913, partly!

Nile Land. Bongo: Gir, *Schweinfurth*, 1422!

The two anticous sepals appear at first sight to be one segment of equal breadth with the posticous segment.

4. ***P. angolana***, *S. Moore in Journ. Bot.* 1880, 229. Leaves up to 4 $\frac{1}{2}$ by 2 in., sparingly pubescent; petiole up to 1 $\frac{3}{4}$ in. long. Inflores-

cences short-cylindric or ovoid; lowest floral leaf orbicular, upper elongate elliptic-oblong. Two anticous calyx-segments ligulate-spathulate; otherwise as *P. parviflora*.—*Micranthus angolanus*, O. Kuntze, Rev. Gen. 493.

Lower Guinea. Angola: Golungo Alto, *Welwitsch*, 5146, 5175! Congo, *Smith! Büttner*, 455!

This differs from the preceding species by the large leaves and the narrower bracts to the spikes.

5. ***P. Poggei***, *C. B. Clarke*. Leaves up to 4 by $1\frac{3}{4}$ in., sparingly pubescent; petiole up to $1\frac{3}{4}$ in. long. Inflorescences short-cylindric; upper floral leaves elongate up to $\frac{1}{2}$ – $\frac{2}{3}$ in. long. Posticous calyx-segment elliptic-oblong, tip triangular acute; 2 anticous calyx-segments ligulate. Corolla-tube hardly $\frac{1}{4}$ in. long; otherwise as *P. parviflora*—*Micranthus Poggei*, Lindau in Engl. Jahrb. xvii. 108, and in Engl. & Prantl, Pflanzenfam. iv. 3B. 298. *Phaulopsis Poggei*, Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 305.

Nile Land. British East Africa: East side of Lake Albert Nyanza, *Scott-Elliot*, 8086!

Lower Guinea. Lower Congo: Stanley Pool, 900 ft., *Hens*, 52!

South Central. Congo Free State: Nyangwe, on the River Lualaba, *Pogge*, 978!

Mozamb. Dist. German East Africa: Kilimanjaro, 5000 ft., *Johnston*, 102! British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte!* Songwe and Karonga, 1700–2000 ft., *Whyte!* Mount Chiradzulu, 4000 ft., *Whyte!*

This species resembles *P. angolana* in the habit and large leaves; it differs strikingly on account of the very leafy look of the inflorescences.

6. ***P. microphylla***, *T. Anders. MS.* Innovations and inflorescences hairy, stem and leaves soon glabrescent. Leaves all small, longest up to 1 in. long. Inflorescences ovoid, scarcely $\frac{3}{4}$ in. in diam., many-flowered, obscurely strobilate; floral leaves (except a few of the lowest) elliptic or oblong. Calyx: posticous segment oblong-elliptic, 2 anticous segments linear-oblong, slightly spathulate. Corolla $\frac{1}{4}$ in. long; otherwise as *P. parviflora*.—*Micranthus microphyllus*, O. Kuntze, Rev. Gen. 493. *M. silvestris*, Lindau in Engl. Jahrb. xvii. 107, and in Engl. & Prantl, Pflanzenfam. iv. 3B. 298. *Phaulopsis silvestris*, Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 305; Cummins in Kew Bulletin, 1898, p. 77.

Upper Guinea. Ashanti: Assin-yan-Coomassie, *Cummins*, 71! Cameroons: Buea, *Preuss*, 701!

Lower Guinea. Gaboon: Munda; Sibange Farm, *Soyaux*, 6! Gaboon River, *Mann!*

7. ***P. micrantha***, *C. B. Clarke*. Weak; leaves up to 3 by $1\frac{1}{2}$ in., acuminate at both ends, entire, unequal at the base, sparingly pubescent; petiole up to $1\frac{3}{4}$ in. long. Inflorescences ovoid, $\frac{1}{4}$ in. long, or of very few flowers. Calyx $\frac{1}{2}$ in. long; 2 anticous segments narrowly oblanceolate, obtuse. Corolla-tube $\frac{1}{6}$ in. long; capsule $\frac{1}{6}$ in. long.—*Etheilema micranthum*, Benth. in Hook. Niger Fl. 480.

Upper Guinea. Cameroons : Efulen, *Bates*, 259 ! 282 !

Lower Guinea. Island of St. Thomas, *Don* ! *Moller*, 90 !

8. **P. obliqua**, *S. Moore in Journ. Bot.* 1880, 229. Leaves up to 2 by 1 in., acuminate, at both ends, regularly crenate-serrate, unequal at the base, sparingly pubescent ; petiole up to $\frac{2}{3}$ in. long. Flowers in axillary clusters $\frac{1}{4}$ in. in diam., not at all strobilate. Calyx $\frac{1}{5}$ in. long ; 2 anticous segments linear. Corolla scarcely $\frac{1}{4}$ in. long.—*Micranthus obliquus*, O. Kuntze, *Rev. Gen.* 493 ; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3B. 298, and in *Bolet. Soc. Brot.* x. 147. *M. Hensii*, Lindau in *Engl. Jahrb.* xxii. 114. *Phaulopsis obliquus*, Lindau in *Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.-iv.* 305.

Lower Guinea. Gaboon River, *Mann*, 1008 ! Lower Congo : Stanley Pool, 1000 ft., *Hens*, 29 ! Angola : Golungo Alto, *Welwitsch*, 5115 !

9. **P. Johnstoni**, *C. B. Clarke*. Small, twiggy, branched, glabrescent. Leaves and flower-clusters mostly at the ends of branches, glandular-pubescent. Leaves up to $1\frac{1}{2}$ by $\frac{1}{3}$ in., narrowed at both ends, entire, mostly sessile ; petiole occasionally $\frac{1}{8}$ in. long ; leaves often passing gradually into lower bracts. Clusters of flowers approximate, not strobilate. Two anticous calyx-segments linear. Corolla nearly $\frac{1}{3}$ in. long. Filaments sparsely hairy ; anther-cells all strongly tailed. Ovary with hairs and glands nearly to the base.

Lower Guinea. Angola : Huilla, *Antunes*, A. 117 ! by the river Cunene, *Johnston* ! Quita ; Gambos, *Newton* !

10. **P. Barteri**, *T. Anders. in Journ. Linn. Soc.* vii. 27. Stems 1–3 ft. high (at the least). Leaves up to $4\frac{1}{2}$ by 2–1 in., acuminate at both ends, ovate or elliptic but more often oblong, entire, glabrescent or minutely scabrous ; petiole in the type examples 0– $\frac{1}{2}$ in. long, sometimes $1\frac{1}{2}$ in. long. Spikes in the type $2\frac{1}{2}$ by 1 in., dense strobilate ; lower bracts depressed-orbicular. Posticous calyx-segment elliptic or oblong, two anticous free very nearly to the base, linear, spathulate. Corolla-tube $\frac{1}{3}$ in. long, upper half inflated funnel-shaped or almost campanulate.—*Micranthus Barteri*, O. Kuntze, *Rev. Gen.* 493 ; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3B. 298. *M. togoensis*, Lindau in *Engl. Jahrb.* xx. 8. *Phaulopsis Barteri*, Lindau in *Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.-iv.* 305.

Upper Guinea. Togoland : Bismarckburg, *Kling*, 186 ! 193 ! 194 ! *Büttner*, 177 ! 336 ! *Baumann*, 364 ! Niger Territory : Nupe, *Barter*, 913 ! Lower Niger : Onitsa, *Barter*, 845 ! Cameroons : Victoria, *Preuss*, 1208 !

Nile Land. British East Africa : Bongo ; Addai, *Schweinfurth*, 2520 ! Jur ; Dimo, *Schweinfurth*, 4267 !

Lower Guinea. Gaboon River, *Mann*, 1010 !

T. Anderson founded this species, by uniting Barter 845 and 913, and ascribing to them the character "two anticous calyx-segments connate more than half-way up," which is not the case ; in both of them, and in all the material brought here, these segments are (as throughout the genus) nearly free. Barter 845, with scabrous leaves, is

identical with the example of *P. togoensis* communicated by Lindau. Barter 913 has very large leaves (not scabrous), and is like Schweinfurth's 2520, which has leaves up to 7 in. long.

11. **P. lankesterioides**, *C. B. Clarke*. Leaves $1\frac{1}{2}$ by $\frac{2}{3}$ in., hairy; petiole $\frac{1}{5}$ in. long. Inflorescences 2 by $1\frac{1}{3}$ in., dense, substrobilate; bracts $\frac{1}{2}$ – $\frac{2}{3}$ in. in diam., orbicular. Two anticous calyx-segments, $\frac{1}{2}$ in. long, linear, not widened upwards. Corolla pale-red; tube $\frac{4}{5}$ –1 in. long, linear, not inflated at the top.—*Micranthus lankesterioides*, Lindau in Engl. Jahrb. xx. 9, and in Engl. & Prantl, Pflanzenfam. iv. 3B. 298, fig. 120, G–H. *Phaulopsis lankesterioides*, Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 305.

Lower Guinea. Angola: Malange, *Buchner*, 156! Katete Berg, *Buchner*, 630!

12. **P. glandulosa**, *C. B. Clarke*. Branches slender, woody. Leaves up to $1\frac{3}{4}$ by $\frac{1}{3}$ in., lanceolate, narrowed to both ends, sessile, when mature very thinly hairy. Spikes 1–2 by 1 in., rather dense, hairy; bracts $\frac{3}{4}$ in. long, narrow-elliptic; bracteoles 0. Posticous calyx-segment $\frac{1}{2}$ by $\frac{1}{10}$ in., other 4 segments subequal, $\frac{1}{3}$ in. long, linear, pubescent. Corolla-tube exceeding 1 in. in length, linear to the top; lobes 5, obovate, $\frac{1}{3}$ in. long. Stamens 4, subsimilar; anthers exerted, short, ovate, microscopically pointed at the base; pollen ellipsoid, trigonous, longitudinally ribbed. Style hairy, branches one short and linear-oblong, the other suppressed.—*Micranthus glandulosus*, Lindau in Engl. Jahrb. xxii. 115.

Lower Guinea. Angola: Huilla; Chella Mountains, *Johnston*! Antunes, 117!

24. **PETALIDIUM**, Nees; Benth et. Hook. f. Gen. Pl. ii. 1081.

Calyx small; segments lanceolate or linear, 2 anticous connate $\frac{1}{4}$ their length or (in most African species) nearly to the tip. Corolla small (or in *P. coccineum* 1 in. long); tube straight or curved, dilated in the upper half or only funnel-shaped at the very top; segments 5, contorted in bud, nearly equal (or in *P. variabile* unequal), two-lipped or not. Stamens 4, subsimilar; filaments nearly glabrous except at the base; anther-cells parallel, subequal, base short-tailed apiculate or mucous; pollen ellipsoid, longitudinally few ribbed, stopples 3, with (nearly always) 1 tubercle above and below each stopple. Style thinly hairy; stigmatic arms linear-oblong, subequal or unequal, rarely one obsolete. Ovary with 2 ovules in each cell, glabrous. Capsule small, commonly $\frac{1}{4}$ in. long, sessile, ovate or ellipsoid, compressed, hard, brown, shining, woody throughout, placentæ with seeds rising elastically from the base of the capsule. Seeds 4 or more often 2, with numerous hygroscopic hairs.—Small, shrubby. Leaves entire. Pedicels to flowers very short; inflorescence of contracted monopodial cymes, often reduced to single flowers, of which many branches are often sterile and carrying linear (often long ciliate) bracts. Bract small, narrow,

or 0; bracteoles large, ovate or elliptic, concave, enclosing calyx, ultimately more or less scarious and reticulately veined.

Species 18 in Africa and the Mascarene Islands; 1 in India.

* PSEUDOBARLERIA. Two anticous calyx-segments connate more than $\frac{1}{2}$ their length.

Innovations tomentose with stellate white hairs. (See also 15. *P. canescens*).

Inflorescence lax or flowers solitary.

Inflorescences without sterile branches interspersed.

Leaves obvate-oblong, obtuse.

Bracteoles $\frac{1}{2}$ in. long. or more 1. *P. latifolium*.

Bracteoles less than $\frac{1}{2}$ in. 2. *P. englerianum*.

Leaves (up to 2 in. long) with acute triangular tip 3. *P. physaloides*.

Spikes loose, several-flowered, interspersed with sterile branches 2-3 in. long 4. *P. Welwitschii*.

Inflorescences very dense, near the base of the stem.

Leaves round; hairs stellate 5. *P. halimoides*.

Leaves oblong; hairs dendroid 6. *P. lanatum*.

Innovations with simple sometimes gland-tipped (not stellate white) hairs.

Inflorescence lax or flowers solitary (See also 15. *P. canescens*).

Inflorescences without sterile branches interspersed.

Leaves $\frac{3}{5}$ in. long; cymes small; plant white strigose 7. *P. ovatum*.

Leaves 1 in. long; flowers 3-1 together; hairs gland-tipped 8. *P. glandulosum*.

Leaves 3 in. long, glandular pubescent; flowers 5-1 together 9. *P. Currori*.

Inflorescence with sterile branches interspersed.

Spines representing sterile branches, $\frac{3}{4}$ in. long.

Corolla-tube $\frac{3}{4}$ in. long 10. *P. spiniferum*.

Corolla-tube $\frac{1}{3}$ - $\frac{1}{2}$ in. long 11. *P. huillense*.

Sterile branches $\frac{1}{4}$ - $\frac{1}{3}$ in. long, hardly spinous (See also 14. *P. variabile*).

Leaves $\frac{1}{2}$ in. long; inflorescences usually near the base of the stem 12. *P. rupestre*.

Leaves $1\frac{1}{2}$ in. long; inflorescences in upper part of the stem 13. *P. glutinosum*.

Inflorescences dense, many-flowered.

Whole plant densely and minutely (yellow or dusky) hairy 14. *P. variabile*.

Innovations densely white strigose (no stellate hairs) 15. *P. canescens*.

Whole plant with innovations (except inflorescences) glabrous 16. *P. Lepidagathis*.

** EU - PETALIDIUM. Two anticous calyx-segments connate less than $\frac{1}{2}$ their length; corolla fine red; tube 1 in. long or more 17. *P. coccineum*.

1. **P. latifolium**, *C. B. Clarke*. Low shrub, covered densely with white stellate hairs which disappear from the older parts. Leaves up

to $1\frac{3}{4}$ by $\frac{3}{4}$ in., obovate-oblong, obtuse with minute mucro, base tapering; petiole $0-\frac{1}{2}$ in. long. Flowers few, loosely approximate or solitary on the upper part of the branches; "yellow and chocolate" (*Lugard*); bracteoles $\frac{1}{2}$ by $\frac{1}{3}$ in. Calyx $\frac{1}{3}$ in. long; two anticous segments connate $\frac{2}{3}$ their length. Corolla yellow; tube more than $\frac{1}{2}$ in. long; slightly funnel-shaped at the top. Filaments sparsely hairy; anthers at the base mucronate, hardly tailed.—*Pseudobarleria latifolia*, Schinz in Verhandl. Bot. Ver. Brandenb. xxxi. 197.

Lower Guinea. German South West Africa: Amboland; Oshando, *Schinz*, 88! Dammaraland, *Een*!

Mozamb. Dist. British Central Africa: Ngamiland, Kwebe, *Lugard*, 121!

2. **P. englerianum**, *C. B. Clarke*. Low shrub, covered densely with stellate hairs which disappear from the older parts. Leaves up to $1\frac{1}{2}$ by $\frac{1}{2}$ in., obovate-oblong, obtuse, with minute mucro, base tapering; petiole $0-\frac{1}{3}$ in. long. Flowers 3–7 in loose short spikes near the middle of a branch; bracteoles $\frac{2}{5}$ by $\frac{1}{4}$ in. Calyx $\frac{1}{4}$ in. long; 2 anticous segments connate $\frac{4}{5}$ their length. Corolla-tube $\frac{2}{5}$ in. long. Capsule more than $\frac{1}{4}$ in. long.—*Pseudobarleria engleriana*, Schinz in Verhandl. Bot. Ver. Brandenb. xxxi. 197.

Lower Guinea. German South West Africa: Hereroland; Omapin, *Schinz*, 67!

This looks as if it might be a small example of *P. latifolium*; but the bracteoles are much smaller.

3. **P. physaloides**, *S. Moore* in *Journ. Bot.* 1880, 225, 228, t. 212, fig. 2. Innovations densely tomentose with white stellate hairs which soon disappear; branches erect, quadrangular, rather slender. Leaves up to 2 by 1 in., narrowed at both ends, glabrous when mature, tip acutely triangular; petiole $0-\frac{1}{2}$ in. long. Flowers solitary or 2 approximated towards the upper part of the branches; bracteoles $\frac{1}{2}$ by $\frac{1}{3}$ in., veined, stellate hairs more or less persistent. Calyx $\frac{1}{3}$ in. long; two anticous segments connate $\frac{3}{4}$ their length. Corolla orange-red (*S. Moore*); tube $\frac{1}{2}$ in. long, slightly widened at the top. Filaments (free portion) nearly glabrous. Capsule exceeding $\frac{1}{4}$ in. long, often 2-seeded.—*Pseudobarleria physaloides*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 299.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 5000!

4. **P. Welwitschii**, *S. Moore* in *Journ. Bot.* 1880, 227, 228, t. 212, fig. 1. Procumbent shrub, innovations densely tomentose with white stellate hairs which soon disappear more or less. Leaves up to $1\frac{1}{2}$ by 1 in., tip obtuse triangular, base suddenly narrowed; petiole $\frac{1}{8}-\frac{1}{2}$ in. long. Flowers 3–12 in loose axillary compound spikes, interspersed with many barren branchlets 2–3 in. long carrying distant linear-oblong bracts $\frac{1}{8}-\frac{1}{3}$ in.; bracteoles $\frac{1}{2}$ by $\frac{1}{3}$ in. Calyx $\frac{1}{3}$ in. long; two anticous segments connate more than $\frac{3}{4}$ their length. Corolla blue (*S. Moore*); tube $\frac{2}{3}$ in. long, inflated in the upper $\frac{1}{3}$. Filaments glabrous except near the base; anthers minutely tailed. Capsule $\frac{1}{4}$ in. long or more,

ovate, often 2-seeded.—*Pseudobarleria Welwitschii*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 300.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 504!

5. ***P. halimoides***, *S. Moore in Journ. Bot.* 1880, 228. Procumbent shrub; innovations tomentose with more or less persistent stellate hairs. Leaves $1\frac{1}{4}$ in. in diam., roundish; petiole $\frac{1}{2}$ in. long. Flowers in dense heads often in the lower part of the stems, intermixed with sterile branches 1 in. long, which in fruit harden into spines; bracteoles $\frac{1}{4}$ in. long, or a little more, reticulately veined. Calyx $\frac{1}{5}$ in. long; segments obtuse, 2 anticous connate $\frac{3}{4}$ their length. Corolla red; tube $\frac{1}{3}$ in. long, dilated upwards. Filaments glabrous except at the base; anthers minutely tailed. Capsule $\frac{1}{4}$ in. long, often 2-seeded.—*P. loranthifolium*, *S. Moore in Journ. Bot.* 1880, 227, 228. *Barleria halimoides*, *Nees in DC. Prod.* xi. 231; *T. Anders. in Journ. Linn. Soc.* vii. 32. *Pseudobarleria halimoides* and *P. loranthifolia*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 300.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 4997! and without precise locality, *Curror*!

6. ***P. lanatum***, *C. B. Clarke*. Densely woolly with white dendroid hairs. Leaves $2\frac{1}{2}$ by 1 in., wool disappearing with age, tip triangular apiculate; petiole $0-\frac{1}{4}$ in. long. Spikes oblong up to 2 by $\frac{1}{2}$ in., or ovoid, very dense, mostly near the base of the branches; linear bracts $\frac{1}{2}-\frac{2}{3}$ in. long, of sterile branches numerous exceeding the bracteoles; bract $\frac{1}{4}$ in. long, linear; bracteoles $\frac{2}{5}$ in. long, reticulately veined. Calyx $\frac{1}{4}$ in. long; 2 anticous segments connate $\frac{3}{4}$ their length. Corolla brown-orange (*Engler*); tube $\frac{1}{4}$ in. long; lobes small narrow. Filaments hairy; anthers (at least of the anticous stamens) minutely tailed. Style thinly hairy, one branch suppressed.—*Pseudobarleria lanata*, *Engl. in Engl. Jahrb.* x. 258; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 300.

Lower Guinea. German South West Africa: Hereroland; Hykamkab, 1200 ft., *Marloth*, 1280!

7. ***P. ovatum***, *C. B. Clarke*. Undershrub, up to 3 ft. high, densely white-tomentose with minute adpressed, not stellate, hairs. Leaves $\frac{3}{8}$ by $\frac{1}{2}$ in., ovate, thick; petiole up to $\frac{1}{12}$ in. long. Inflorescence in small rather loose cymes; bract $\frac{1}{8}$ in. long; bracteoles $\frac{1}{2}$ in. long, ovate, reticulately veined. Calyx $\frac{1}{4}$ in. long; two anticous segments connate nearly to the top. Corolla-tube $\frac{1}{2}$ in. long; anther-cells 8, all distinctly and minutely white-spurred. Capsule hardly exceeding $\frac{1}{4}$ in. long; style-base enlarged with two discs on the posticous face (like those generally present in *Blepharis*).—*Pseudobarleria ovata*, *Schinz in Verhandl. Bot. Ver. Brandenb.* xxxi. 198.

Lower Guinea. German South West Africa: Dammaland; Otjimbingue, *Lindner*! Kaoko, *Belck*, 20!

8. **P. glandulosum**, *S. Moore in Journ. Bot.* 1880, 226. Innovations with small hairs, many gland-tipped. Leaves up to $1\frac{1}{3}$ by $\frac{2}{3}$ in., ovate; petiole up to $\frac{1}{3}$ in. long. Inflorescences few-flowered, very lax, both near the base and the top of a branch; bracteoles $\frac{2}{3}$ in. long, ovate, reticulate-veined, glandular-pubescent. Calyx $\frac{1}{4}$ in. long; two anticous segments connate almost to the tip, posticous segment narrow-oblong from an ovate base. Corolla-tube $\frac{3}{4}$ in. long, moderately inflated in the upper half. Style thinly hairy, branches nearly equal.—*Pseudobarleria glandulosa*, Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3B. 299.

Lower Guinea. Angola: Benguela, *Welwitsch*, 5047!

9. **P. Currori**, *S. Moore in Journ. Bot.* 1880, 226, 228. Stout undershrub, subpersistently glandular-pubescent all over. Leaves up to $3\frac{1}{2}$ by $1\frac{1}{2}$ in., ovate; petiole up to $\frac{1}{4}$ in. long. Inflorescences of 1–5 flowers, loose, scattered; bracteoles 1 by $\frac{1}{2}$ in., subacute, reticulately veined. Calyx $\frac{1}{2}$ in. long; segments acute, 2 anticous united nearly to the tip. Corolla-limb of 5 subequal ovate segments, about $\frac{2}{3}$ in. in diam. Filaments glabrous except at the base; anthers at the base mucronulate, hardly spurred. Style thinly hairy, branches 2 linear, unequal. Capsule nearly $\frac{1}{3}$ in. long, 4–2-seeded.—*Pseudobarleria hirsuta*, T. Anders. in *Journ. Linn. Soc.* vii. 26. *P. Currori*, Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3B. 300.

Lower Guinea. Angola, *Curror*!

10. **P. spiniferum**, *C. B. Clarke*. Hairy with simple and gland-tipped hairs. Leaves (only some on young shoots seen), 1 by $\frac{1}{5}$ in., narrowly elliptic. Flowers 1 or 2 on very short axillary branches ending in stout spines $\frac{3}{4}$ in. long; bract obsolete; bracteoles $\frac{3}{4}$ by $\frac{1}{5}$ in., narrowly elliptic-oblong, hairy, not strongly veined. Calyx: posticous segment $\frac{1}{3}$ in. long, 2 anticous segments connate nearly to the tip. Corolla-tube $\frac{3}{4}$ in. long, nearly equally cylindrical; lobes $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Anthers, pollen and stigmas of the genus. Capsule $\frac{1}{3}$ in. long; seeds of the genus.—*Petalidii* sp. nova, *S. Moore in Journ. Bot.* 1880, 228.

Lower Guinea. Angola: Chella Mountains, *Johnston*!

Var. *obtusum*, *C. B. Clarke*. Leaves obovate-elliptic very obtuse. Corolla rather smaller.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 4998!

11. **P. huillense**, *C. B. Clarke*. Hairy with simple and gland-tipped hairs; branchlets 6 in. long. Leaves $\frac{3}{4}$ by $\frac{1}{4}$ in., oblong-elliptic. Flowers 1 or 2 on very short axillary branches ending in spines $\frac{3}{4}$ in. long; bracts obsolete; bracteoles $\frac{1}{2}$ – $\frac{2}{3}$ by $\frac{1}{6}$ in., narrowly elliptic-oblong, not hairy. Calyx: posticous segment $\frac{1}{3}$ in. long, 2 anticous segments connate nearly to the tip. Corolla-tube $\frac{1}{3}$ – $\frac{1}{2}$ in. long, inflated upwards; lobes $\frac{1}{4}$ in. long. Anthers, pollen, and pistil of the genus.

Lower Guinea. Angola: Chiviqua, and banks of the River Cunene, *Newton*!

This can hardly be a small-flowered form of *P. spiniferum*; but no difference except size and shape of corolla can be stated.

12. **P. rupestre**, *S. Moore in Journ. Bot.* 1880, 226, 228. Shrub 2–3 ft. high; innovations moderately pubescent and glandular. Leaves $\frac{1}{2}$ in. long, roundish, ultimately nearly glabrous; petiole $\frac{1}{4}$ in. long. Inflorescence in lax 3–10-flowered heads often near the base of the stem interspersed with short infertile branches carrying linear-oblong bracts $\frac{1}{4}$ – $\frac{3}{4}$ in. long; pedicels and base of bracteoles with long spreading white hairs; bracts $\frac{1}{8}$ – $\frac{1}{6}$ in. long, linear-oblong; bracteoles $\frac{2}{3}$ – $\frac{3}{4}$ in. long, ovate-oblong, finally reticulate-nerved and glabrescent. Calyx nearly $\frac{1}{2}$ in. long; 2 anticous segments connate $\frac{2}{3}$ their length. Corolla white, sometimes rose- or purple-striate; tube $\frac{1}{2}$ in. long or more, funnel-shaped at the top; lobes 5 nearly equal. Filaments nearly glabrous; anthers with small tails. Style very thinly hairy; branches 2, equal. Capsule $\frac{1}{4}$ in. long.—*Pseudobarleria rupestris*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 300.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 5022! Chella Mountains, *Johnston*!

13. **P. glutinosum**, *C. B. Clarke*. Shrub 3 ft. high (*Engler*), clothed with short white gland-tipped hairs and longer several-celled white hairs. Leaves $1\frac{3}{4}$ by $1\frac{1}{4}$ in., tip triangular apiculate; petiole up to $\frac{3}{4}$ in. long. Inflorescences laxly few-flowered in the upper part of the stem, about 1 in. in diam. with a few short sterile branches interspersed; bracteoles $\frac{2}{3}$ in. long, elliptic, subacute. Calyx $\frac{1}{3}$ in. long, with simple suberect short hairs all over; two anticous segments connate $\frac{4}{5}$ their length. Corolla dusky orange (*Engler*); tube $\frac{1}{2}$ in. long, funnel-shaped upwards. Anthers mucronate at the base. Capsule $\frac{1}{4}$ in. long.—*Pseudobarleria glutinosa*, Engl. in Engl. Jahrb. x. 259; Lindau in Engl. Jahrb. xviii. 63, t. 1, fig. 13, and in Engl. & Prantl, Pflanzenfam. iv. 3B. 300.

Lower Guinea. German South West Africa: Hereroland; Usakos, 2800 ft., *Marloth*, 1435!

14. **P. variabile**, *C. B. Clarke*. Minutely puberulous and yellowish-green, or densely adpressed ashy-hairy all over. Leaves 1 by $\frac{1}{2}$ – $\frac{2}{3}$ in., obtuse; petiole $\frac{1}{8}$ in. long. Spikes rather lax, 6–10-flowered, with few short sterile branches, hardly spinous; bracts $\frac{1}{8}$ in. long, lanceolate, obtuse; bracteoles $\frac{2}{3}$ in. long. Sepals about as long as the bracteoles. Corolla-tube $\frac{1}{2}$ in. long; anticous lobe of limb $\frac{1}{6}$ in. broad, nearly twice as wide as the others.—*Pseudobarleria variabilis*, Engl. in Engl. Jahrb. x. 259, var. included; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 300.

Lower Guinea. German South West Africa: Hereroland; Usakos, 3000 ft., *Marloth*, 1242! 1242B! *Luderitz*!

15. **P. canescens**, *C. B. Clarke*. Small undershrub; innovations densely strigose with minute simple white hairs. Leaves 2 by $1\frac{3}{4}$ in., nearly round, ultimately glabrescent, tip minutely triangular; petiole up to 1 in. long. Inflorescence 2 in. in diam., compound, dense, many-flowered, near the base of a branch, with barren short branches inter-

spersed; bracts of barren branches linear, 1 by $\frac{1}{20}$ in., clothed with spreading white hairs $\frac{1}{8}$ in. long; bracteoles $\frac{1}{3}$ in. long. Calyx $\frac{1}{4}$ in. long; two anticous segments connate $\frac{2}{3}$ their length. Corolla dusky blue (*Engler*); tube $\frac{2}{3}$ in. long, inflated in the upper part. Filaments minutely hairy; anthers tailed. Disc large pyramidal. Style-branches linear, unequal. Capsule $\frac{1}{4}$ in. long.—*Pseudobarleria canescens*, Engl. in Engl. Jahrb. x. 258; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 300.

Lower Guinea. German South West Africa: Hereroland; Karribib, 3200 ft., *Marloth*, 1429! Hykamkab, 1000 ft., *Marloth*, 1199! Usakos, *Lindner*!

16. **P. Lepidagathis**, *S. Moore in Journ. Bot.* 1880, 227, 228. Glabrous (even innovations) except the inflorescences. Leaves $3\frac{1}{2}$ by $\frac{3}{4}$ –1 in., lanceolate, tapering at both ends; petiole up to 1 in. long. Inflorescences on short axillary branches near the base of the branches, 2–1 by 1 in., dense, interspersed with very short sterile branches; bracts to sterile branches $\frac{3}{4}$ –1 by $\frac{1}{16}$ in. with spreading white hairs $\frac{1}{12}$ in. long; bracteoles hardly $\frac{1}{3}$ in. long. Calyx $\frac{1}{5}$ in. long, minutely hairy within and without; two anticous segments connate nearly to the tip. Corolla red or brownish-red; tube nearly $\frac{1}{2}$ in. long, slender, a little dilated at the top; limb hardly $\frac{1}{3}$ in. in diam. Filaments glabrous except at the base; anthers minutely tailed. Capsule scarcely $\frac{1}{5}$ in. long, 2-seeded where seen—*Pseudobarleria Lepidagathis*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 300

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 5007! 5020!

This remarkable species is so closely mimetic of the “radical-flowering” species of *Lepidagathis* (*L. radicalis*, &c.) that an experienced collector might pass it for one.

17. **P. coccineum**, *S. Moore in Journ. Bot.* 1880, 225, 228. Stem round, stoutish; innovations softly hairy, a few hairs gland-bearing. Leaves up to $2\frac{1}{2}$ by 2 in., ovate, obtuse, glabrescent, base obtuse or cordate; petiole $\frac{3}{4}$ in. long, hairy. Flowers 3–1 together, scattered; bracteoles up to 1 by $\frac{1}{2}$ in. (many only $\frac{3}{4}$ by $\frac{1}{5}$ in.) Calyx: posticous segment nearly $\frac{1}{3}$ in. long, other segments $\frac{1}{4}$ in. long, 2 anticous connate for $\frac{1}{3}$ their length. Corolla bright red; tube exceeding 1 in. long, curved at the middle and much inflated above it; lobes 5, subequal, $\frac{2}{3}$ in. long, obovate. Filaments glabrous except at the base; anthers linear, at the base muticous or with a hair. Ovary glabrous; style sparsely hairy, branches linear, subequal.—*Pseudobarleria coccinea*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 299.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 5017! 5018! Huilla, *Antunes*, 90! in thickets by the River Cunene, *Schinz*, 10! Humbe, banks of the River Cunene, and Chiviqua, *Newton*! Amboland: Ondonga, *Schinz*!

Lindau esteems this species a *Pseudobarleria*, in doing which he abandons the only character (viz., the degree of union of 2 anticous calyx-segments) on which the genus *Pseudobarleria* stands. The analogy of the allied genera, *Dyschoriste*, *Ruellia*, &c., warns us that the character need not be made generic.

25. **BLEPHARIS**, Juss.; Benth. et Hook. f. Gen. Pl. ii. 1089.

Calyx sub-4-partite to the base; 2 anticous segments connate nearly to the tip; posticous segment lanceolate 3-nerved, usually longer than the anticous; 2 interior segments narrow, long or short. Corolla: posticous lip 0, replaced by a horny rim; anticous lip nearly flat, 3-5-lobed, blueish, white, or fading to yellowish. Stamens 4, subsimilar; anthers 1-celled, narrow-oblong, muticous, fringed with white hairs near the slit; filaments of 2 anticous stamens more flattened with rudiments of missing anther more developed; pollen longish-ellipsoid, with a few very narrow longitudinal smooth chinks not reaching the poles. Ovary with 2-1 ovules in each cell, glabrous; style glabrous (rarely with a few thin hairs below), branches 2, lanceolate; at the apex of the ovary on the posticous face are 2 hollows filled with glands. Capsule ellipsoid, flattened, woody, shining-brown, 2- (rarely 4-) seeded; seeds covered with rope-like hair-bundles, which on applying water unroll into very long 1-celled hairs each furnished with a spiral band within.—Harsh prickly, or smooth slender, undershrubs without stellate or gland-tipped hairs, except in *B. pungens*. Leaves (in all Tropical African species, except *B. tetrasticha*) by the adjacent pairs being drawn together appearing in whorls of 4, outer pair in each whorl often smaller, sometimes very much smaller, or reduced and almost resembling stipules. Spikes of flowers strobilate; bract green, ovate or obovate, veined, nearly always spinous; bracteoles 2 or 0, linear, rarely lanceolate, 1-nerved, acute; in many spikes all the bracts except the highest sterile, so that these are commonly described as having solitary flowers.

Species 50, nearly all African, many in South Africa, a few extending through Arabia and the Orient region to India.

* Leaves not spinous on the margin (or with sometimes a few small spines, in 6. *B. affinis*, 14. *B. linariæfolia*, and 15. *B. Asteracanthus*).

Bracteoles none. Every flower with 3-6 sterile bracts below it. (Note that the true flower-bract is next the two connate anticous calyx-segments. The bracteoles, when present, are lateral, thin-textured, except the midrib).

One-flowered branches solitary.

Leaves 1-2½ in. long, occasionally 4 in. long.

Bract ¼-⅓ in. long.

Bract spathulate or obovate, tip triangular obtuse

Bract broadly obovate tip lanceolate recurved

Bract ½ in. long; corolla more than 1 in. long

Bract ¾ in. long, elliptic-lanceolate

Leaves 4-7 in. long; 1-flowered spikes pedicelled

One-flowered branches approximated or in heads.

Leaves linear; inmost calyx-segments nearly as long as the others

1. *B. boerhaaviaefolia*.

2. *B. pinguior*.

3. *B. cuanzensis*.

5. *B. glumacea*.

4. *B. hirtella*.

6. *B. affinis*.

- Leaves linear-oblong; inmost calyx-segments short 7. *B. Bainesii*.
- Bracteoles at least $\frac{1}{2}$ as long as the calyx, lanceolate, 1-nerved.
- One-flowered branches solitary.
- Corolla $\frac{1}{2}$ in. long.
- Leaves not bristly.
- Herb. Leaves hairy or glabrate 8. *B. molluginifolia*.
- Dense woody undershrub. Leaves small, glabrate 10. *B. fruticulosa*.
- Leaves scabrous with white stiff hairs 9. *B. setosa*.
- Corolla 1 in. long 11. *B. ruwenzoriensis*.
- One-flowered branches approximate or in heads or strobilate.
- Corolla blue.
- Spikes in loose heads.
- Two innermost calyx-segments short 12. *B. pratensis*.
- Two innermost calyx-segments long 13. *B. Welwitschii*.
- Spikes strobilate; leaves linear, sometimes slightly toothed 14. *B. linariæfolia*.
- Spikes dense, compound, terminal; flowers large 15. *B. Asteracanthus*.
- Corolla clear yellow 16. *B. Sol*.
- ** Leaves prickly-spinous on the margins (see also 6. *B. affinis*, 14. *B. linariæfolia*, 15. *B. Asteracanthus*, in which the leaves are sometimes toothed).
- Leaves in each pseudo-verticil 4, heteromorphic, the outer pair (in the middle of the stem) often much reduced, appearing as spinous stipules.
- Leaves linear; inflorescences of short heads 17. *B. Buchneri*.
- Leaves broad-elliptic; inflorescences strobilate 18. *B. chrysotricha*.
- Leaves in decussate subequal pairs 19. *B. tetrasticha*.
- Leaves in each pseudo-verticil 4, not very unequal.
- Ovary (and fruit) with a large horny obversely mitriform cap 20. *B. obmitrata*.
- Ovary without a large cap.
- Inflorescences strobilate.
- Leaves with spreading teeth; spikes close 21. *B. edulis*.
- Leaves with forward-pointing teeth; spikes looser 22. *B. serrulata*.
- One-flowered branches in dense scorpioid compound cymes 24. *B. panduriformis*.
- One-flowered branches in numerous axillary subcapitate clusters.
- Corolla shaggy 25. *B. acanthodioides*.
- Corolla slightly hairy 26. *B. longifolia*.
- One-flowered branches solitary or 2-4 approximated.
- Spines 1-2 in. long, linear, stout, woody, spinous 23. *B. Noli-me-tangere*.
- Spines $\frac{1}{4}$ - $\frac{1}{2}$ in. long.
- Leaves oblong-elliptic; 1-flowered branches mostly 2-4 together 27. *B. diversispina*.
- Leaves linear or linear oblong; 1-flowered branches solitary 29. *B. pungens*.
- One-flowered branches in dense heads 2-3 in. in diam. 28. *B. grandis*.

1. **B. boerhaaviaefolia**, *Pers. Syn.* ii. 180. Procumbent, slender, hairy or nearly glabrate. Leaves apparently 4-nate in distant whorls, up to $4\frac{1}{2}$ by $1\frac{1}{3}$ in. (in Kirk's examples), commonly $1\frac{1}{2}$ by $\frac{1}{2}$ in., frequently small, elliptic, narrowed at both ends, entire, sessile. One-flowered branches sessile, axillary, solitary or clustered; bract (i.e., the true flower-bract in the axil of which the flower stands) $\frac{1}{4}$ – $\frac{1}{3}$ in., spathulate or spathulate-obovate, rigid, with 3 strong green nerves, with 7–15 glochidiate spines ($\frac{1}{10}$ – $\frac{1}{15}$ in. long) round its head; bracteoles 0. Posticous calyx-segment $\frac{2}{3}$ – $\frac{3}{4}$ in. long, 2 inmost calyx-segments about half as long. Corolla $\frac{1}{2}$ in. long, or in form *B. abyssinica*, Hochst., $\frac{3}{4}$ –1 in. long. Capsule $\frac{1}{4}$ in. long, or rather more, 2-seeded.—Nees in DC. Prod. xi. 266; Wight Ic. t. 458; Benth. in Hook. Niger Fl. 481; A. Rich. Tent. Fl. Abyss. ii. 150; T. Anders. in Journ. Linn. Soc. vii. 34; Solms Laub. in Schweinf. Beitr. Fl. Aethiop. 107, 243; Franch. Sert. Somal. 53; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 478; S. Moore in Journ. Bot. 1880, 230; Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 345; Engl. Hochgebirgsfl. Trop. Afr. 389; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 316, fig. 126, B–H, in Pfl. Ost-Afr. C. 369, and in Ann. Istit. Bot. Roma vi. 75. *B. rubiaefolia*, Schumach. Beskr. Guin. Pl. 292. *B. abyssinica*, Hochst. MS. in Schimper 247. *B. Togodelia*, Solms. Laub. in Schweinf. Beitr. Fl. Aethiop. 108, 243; Lindau in Engl. Pfl. Ost-Afr. C. 369. *B. involucrata*, Solms Laub. in Schweinf. Beitr. Fl. Aethiop. 107. *Acanthus maderaspatensis*, Linn. Sp. Plant. ed. ii. 892.

Upper Guinea. Senegambia, *Heudelot*, 509! Sierra Leone, *Afzelius*! *Don*! *Scott-Elliott*, 4525! Guinea, *Thonning*! Lagos, *Millen*, 50!

Nile Land. Eritrea: Aidereso, 4000 ft., *Schweinfurth & Riva*, 1431! Ginda, 3200 ft., *Schweinfurth & Riva*, 2130! Abyssinia: Hamasen, *Steudner*, 1510! 1530! 1531! Tigre; Axum, *Schimper*, 1492! Adowa, *Petit*, 328! Mount Sholoda, *Schimper*, 247! Serriro, 800 ft., *Schimper*, 497! Teramne and Mount Sholoda, *Rohlf & Stecker*! Wadi Togodele, *Ehrenberg*! Samen; Jaja, *Schimper*, 352! and without precise locality, *Pearce*! *Schimper*, 159, 1895! Somaliland, *Mrs. Lort Phillips*! *Miss Edith Cole*! *Riva*, 878! Kordofan, *Pfund*, 440! British East Africa: Bongo, *Schweinfurth*, 27! 2700! 2761! Mombasa, *Scott-Elliott*, 6124! *Kirk*! *Ribe*, *Wakefield*! Taita; Ndi Mountain, *Hildebrandt*, 2545! Maungu Mountain, 2000 ft., *Johnston*!

Lower Guinea. Congo, *Smith*! Angola: Huilla, *Welwitsch*, 5054! Loanda, *Welwitsch*, 5199! 5129! Ambriz, *Monteiro*!

Mozamb. Dist. German East Africa: Kilimanjaro, *Volkens*, 517! Usambara Mascheua, *Holst*, 8854! Kwa Mshuza, *Holst*, 9130! Tanga, *Holst*, 4100! Ugalla River, *Boehm*, 277! and without precise locality, *Fischer*, 482! Portuguese East Africa: near Sena, *Kirk*! Zambesi, *Kirk*! British Central Africa: Nyasaland; Tanganyika Plateau, 2000–3000 ft. *Whyte*! River Shire, *Kirk*! and without precise locality, *Meller*! Lake Nyasa; Lukoma (Likoma Island?), *Bellingham*!

The Abyssinian examples (both of Schimper, Petit, and Steudner) have the flower much larger than in the ordinary weed, and are the *B. abyssinica*, Hochst. MS. Solms Laubach, in Schweinfurth's Beitr. Fl. Aethiopia, appears to have taken this as typical *B. boerhaaviaefolia*; and then to have described as a new species his *B. Togodelia* which is undistinguishable from the Indian weed. Schweinfurth's 2761 has the bracts with recurved tips, the veins beautifully picked out with brown.

2. **B. pinguior**, *C. B. Clarke*. Flower-bract $\frac{1}{2}$ in. long, quadrate-ovate, suddenly narrowed into a narrow-lanceolate spinous tip which is rigidly recurved, adpressed to the back of the (apparently truncate) bract; otherwise as *B. boerhaaviæfolia*.

Mozamb. Dist. Nyasaland, *Buchanan*, 914!

Stem white-hispid (as are some examples of *B. boerhaaviæfolia*). One-flowered branches thicker than those of *B. boerhaaviæfolia*, the 2 inmost calyx-segments longer, the capsule larger.

3. **B. cuanzensis**, *Welw. ex S. Moore in Journ. Bot.* 1880, 230. Slender, hairy or nearly glabrate. Leaves apparently 4-nate in distant whorls, up to $3\frac{1}{2}$ by $\frac{3}{4}$ in. (or in var. *leptophylla*, *S. Moore*, l.c., 3 by $\frac{1}{10}$ in., exactly linear). One-flowered branches (reduced spikes) sessile, axillary, solitary; bract $\frac{1}{2}$ in. long, oblong-obovate; bracteoles 0. Posticous calyx-segment $\frac{3}{4}$ in. long, 3-nerved; 2 inmost segments lanceolate-linear, nearly as long as the 2 connate anticous segments. Corolla exceeding 1 in. in length, purple-blue.—*Engl. Hochgebirgsfl. Trop. Afr.* 390.

Lower Guinea. Angola: Pungo Andongo; Cuanza River, *Welwitsch*, 5101! Huilla, *Welwitsch*, 5030! 5053! 5056! *Antunes!* Humpata, *Newton*, 260!

Closely allied to *B. boerhaaviæfolia*, as *S. Moore* observes.

4. **B. hirtella**, *Lindau in Engl. Jahrb.* xx. 28. Stem white-hirsute. Leaves 4 in a whorl, up to 7 by $\frac{2}{5}$ in., lanceolate. One-flowered branches (reduced spikes) solitary, axillary, on peduncles $0-\frac{2}{5}$ in. long. Posticous calyx-segment exceeding 1 in. in length, 2 inmost segments $\frac{3}{4}$ in. long. Corolla exceeding 1 in. in length, bright blue.

Lower Guinea. Angola; Malange, *Buchner*, 16A!

Closely allied to *B. cuanzensis*, as *Lindau* states. The leaves are much longer, *Lindau* says narrower, but they are not nearly so narrow as in *B. cuanzensis*, var. *leptophylla*, *S. Moore*.

5. **B. glumacea**, *S. Moore in Journ. Bot.* 1880, 232. Sparingly pubescent. Stem slender, flexuous. Leaves apparently in distant whorls of 4, outer pair very much smaller, up to 3 by $\frac{1}{5}$ in., narrowed at either end, sessile. One-flowered branches (reduced spikes) solitary, glabrous or with the calyx puberulous; bract $\frac{3}{4}$ in. long, elliptic-lanceolate; bracteoles 0. Posticous calyx-segment $\frac{2}{3}$ in. long; 2 inmost calyx-segments $\frac{1}{3}$ in. long. Corolla $\frac{3}{4}$ in. long, bluish (*S. Moore*).—*Engl. Hochgebirgsfl. Trop. Afr.* 390; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 317.

Lower Guinea. Angola: Huilla, *Welwitsch*, 5052!

6. **B. affinis**, *Lindau in Engl. Pfl. Ost-Afr. C.* 369. Scabrous-pubescent, becoming glabrous. Leaves in distant whorls of 4, 2 by $\frac{1}{18}-\frac{1}{12}$ in., linear, sessile, entire (or with a few teeth on the margin). One-flowered branches (reduced spikes) in small heads on short lateral branchlets; bract $\frac{1}{8}$ in. long, elliptic-lanceolate, acute, entire, hairy, spine-tipped; bracteoles 0. Posticous calyx-segment $\frac{2}{3}-\frac{3}{4}$ in. long, very obtuse, spine-tipped; 2 anticous calyx-segments connate $\frac{2}{3}$ their length,

spine-tipped; 2 inmost calyx-segments linear-lanceolate, spine-tipped, as long as the anticous segments.—Lindau in Engl. Jahrb. xxiv. 319.

Mozamb. Dist. German East Africa: Bagamoyo, *Stuhlmann*, 7259! Usuramo, *Stuhlmann*, 6671!

7. **B. Bainesii**, *S. Moore, MS.* Branches hispid with white hairs. Leaves 2 by $\frac{1}{4}$ in., linear-oblong, entire, sessile, hispid with white hairs especially on the midrib beneath. One-flowered branches (reduced spikes) densely clustered; sterile bracts and floral-leaves linear-lanceolate, spine-tipped, not spinous on the margins; bract $\frac{1}{2}$ by $\frac{1}{10}$ in., strongly 3-nerved, obtuse, without spines on the margin, with 1 strong subterminal spine; bracteoles 0. Posticous calyx-segment $\frac{1}{2}$ in. long; 2 inmost calyx-segments $\frac{1}{4}$ in. long.

Tropical (?) Africa. South African Gold Fields, *Baines!*

8. **B. molluginifolia**, *Pers. Syn. ii. 180.* Procumbent, slender, hairy or nearly glabrate. Leaves apparently 4-nate in distant whorls, up to 1 by $\frac{1}{4}$ in., from narrow-elliptic to linear-oblong, narrowed at both ends, sessile. One-flowered branches (reduced spikes) sessile, axillary, solitary (rarely 2–3 approximated); bract $\frac{1}{4}$ – $\frac{1}{3}$ in. long, quadrate-obovate, strongly 3-nerved, with 7–15 spines, each $\frac{1}{12}$ – $\frac{1}{10}$ in. long, round its triangular-obtuse head; bracteoles $\frac{1}{3}$ in. long, lanceolate, bristle-tipped. Posticous calyx-segment $\frac{1}{2}$ – $\frac{2}{3}$ in. long; 2 inmost calyx-segments linear-lanceolate, nearly as long. Corolla $\frac{1}{2}$ in. long. Capsule $\frac{1}{4}$ in. long, 2-seeded.—Nees in DC. Prod. xi. 266; T. Anders. in Journ. Linn. Soc. ix. 500; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 479. *B. saturejifolia*, *Pers. Syn. ii. 180*; Nees in DC. Prod. xi. 265; T. Anders. in Journ. Linn. Soc. vii. 34; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 317, and in Engl. Pfl. Ost-Afr. C. 369. *B. rupicola*, Engl. Hochgebirgsfl. Trop. Afr. 389. *B. cuspidata*, Lindau in Ann. Istit. Bot. Roma vi. 76. *Acanthus integrifolius*, Linn. f. Suppl. 294. *A. repens*, Vahl, Symb. ii. 76.

Nile Land. Abyssinia; *Schimper*, 521 partly! Somaliland: near Salole, 2200 ft., *Riva*, 417! British East Africa: Ruwenzori, *Scott-Elliot*, 7534!

Mozamb. Dist. Zanzibar, ex *Lindau*. German East Africa, *Fischer*, 328!
Also in South Africa and India.

This plant much resembles *B. boerhaaviæfolia*, and is mixed with it in herbaria. It usually has narrower leaves. There is nothing outside the calyx of *B. boerhaaviæfolia* at all like the bracteoles here.

9. **B. setosa**, *Nees in DC. Prod. xi. 265.* Leaves 1–1 $\frac{1}{2}$ by $\frac{1}{8}$ in., scabrous with several-celled white hairs. Bracteoles terminated by a long white bristle; otherwise as *B. molluginifolia*.—*B. Hildebrandtii*, Lindau in Engl. Jahrb. xx. 29, in Engl. & Prantl, Pflanzenfam. iv. 3 B. 317, and in Engl. Pfl. Ost-Afr. C. 369.

Nile Land. British East Africa: Taita; Voi River, *Hildebrandt*, 2490!

Lower Guinea. Amboland: Olukonda, *Schinz*, 16!

Also in South Africa.

The Tropical African examples agree exactly with the type-plant of *B. setosa*, Nees; but this type is marked by T. Anderson, "*B. satureiifolia*, var. *linearifolia*, T. Anders."

10. ***B. fruticulosa***, *C. B. Clarke*. A nearly glabrate, small, dense shrub; branches woody. Leaves $\frac{1}{2}$ by $\frac{1}{6}$ in., oblong, hard, whitish. Bracteoles $\frac{1}{2}$ by $\frac{1}{10}$ in. long, lanceolate, mucronate, beautifully veined, minutely hairy upwards. Two inmost calyx-segments like the bracteoles; otherwise as *B. molluginifolia*.

Nile Land. British East Africa: Kikuyu; Kidung Valley, 6000–7000 ft., *Scott-Elliot*, 6612!

11. ***B. ruwenzoriensis***, *C. B. Clarke*. Pubescent, prostrate; leaves $\frac{1}{2}$ in. long, oblong. One-flowered branches (reduced spikes) solitary, sessile; bract $\frac{1}{3}$ in. long, oblong; bracteoles $\frac{1}{3}$ in. long, linear. Posticous calyx-segment $\frac{3}{4}$ in. long; 2 inmost calyx-segments nearly $\frac{1}{2}$ in. long, linear-lanceolate. Corolla 1 in. long, blue (*Scott-Elliot*). Anticous filaments very broad.

Nile Land. British East Africa: Ulu; Lanjora, 5000–6000 ft., *Scott-Elliot*, 6379!

This may prove only a luxuriant mountain form of *B. molluginifolia*. It differs mainly by the much larger corolla.

12. ***B. pratensis***, *S. Moore in Journ. Bot.* 1877, 294. Shrub 6–15 ft. high, hairy, afterwards often glabrate. Leaves apparently in whorls of 4, up to $2\frac{1}{2}$ by $\frac{1}{2}$ – $\frac{2}{3}$ in., somewhat leathery, narrowed at both ends, subsessile. One-flowered branches (reduced spikes) in loose heads; lowest sterile bracts (and floral leaves) lanceolate, often few-spined on the margin; flower-bract proper broadly-obovate, suddenly acuminate, mucronate (without spinous cilia at the tip); bracteoles $\frac{2}{3}$ in. long, lanceolate, acuminate, mucronate, 1-nerved, subentire, i.e. without spines near the tip. Posticous calyx-segment $\frac{3}{4}$ in. long and upwards, lanceolate, mucronate, entire, minutely and closely hairy without; 2 inmost calyx-segments about half as long, lanceolate. Corolla exceeding 1 in. in length, blue.—*Lindau in Engl. Pfl. Ost-Afr. C.* 369.

Nile Land. British East Africa: Mombasa, *Wakefield!* Lamu Island, *Hildebrandt*, 1906!

Mozamb. Dist. German East Africa: Massoga, *Stuhlmann*, 6060!

The bracteoles are said by S. Moore to be 2–3-nerved. The discrepancy between the descriptions of bracteoles here given and those of preceding authors is mainly one of terms, the word "bracteole" being restricted here to the 2 lateral "prophylla."

13. ***B. Welwitschii***, *S. Moore in Journ. Bot.* 1880, 231. Sterile bracts spinous on the margins; flower-bract ovate, acuminate, spinous on the margin. Corolla nearly $1\frac{1}{4}$ in. in length; otherwise as *B. pratensis*.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 317; *Engl. Hochgebirgsfl. Trop. Afr.* 390.

Lower Guinea. Angola: Huilla, *Welwitsch*, 5031!

S. Moore says that this species is very close to *B. pratensis*, and it seems to differ very little except in the more spinous sterile bracts and in the markedly spinous flower-bract. The young branches are more scabrous, the leaves 2 by $\frac{1}{6}$ in. parallel-sided, the flowers rather larger; but these differences are small.

14. **B. linariæfolia**, *Pers. Syn.* ii. 180. Small shrub, hairy, afterwards glabrate. Leaves up to 3 by $\frac{1}{8}$ – $\frac{1}{5}$ in., entire or sparingly toothed, hardly prickly, sometimes with few very small spines. Inflorescences often in forks of the branches, 3–1 by $\frac{3}{4}$ in., strobilate; bracts $\frac{3}{4}$ –1 in., ovate, suddenly and shortly acuminate, more or less recurved, spinous; bracteoles $\frac{1}{2}$ – $\frac{2}{3}$ in. long, linear. Posticous calyx-segment $\frac{1}{2}$ – $\frac{2}{3}$ in. long, ovate; 2 inner calyx-segments half as long, oblong. Corolla $\frac{2}{3}$ –1 in. long, blue.—T. Anders. in *Journ. Linn. Soc.* vii. 36; Zarb in *Cat. Spéc. Bot. Pfund*, 32; Lindau in *Ann. Istit. Bot. Roma* vi. 76. *B. sindica*, T. Anders. in *Journ. Linn. Soc.* ix. 500; C. B. Clarke in *Hook. f. Fl. Brit. Ind.* iv. 479. *B. dichotoma*, Engl. in *Engl. Jahrb.* x. 260. *B. Passargei*, Lindau in *Engl. Jahrb.* xxii. 117. *Acanthodium hirtum*, Nees in *DC. Prod.* xi. 274; A. Rich. *Tent. Fl. Abyss.* ii. 151; Benth. in *Hook. Niger Fl.* 481; Solms-Laub. in *Schweinf. Beitr. Fl. Aethiop.* 102. *A. grossum*, Wight, *Ic. t.* 1535, 1536, not of Nees.

Upper Guinea. Senegal, *Lelièvre!* Senegambia, *Heudelot*, 179! Niger Territory: Nupe, *Barter*, 716! Bornu, *Vogel*, 58! Cameroons: Garua, 800 ft., *Passarge*, 77A!

Nile Land. Kordofan, *Kotschy*, 256! *Pfund*, 15! 430! 433! Æthiopia, *Kotschy*, 58! Gallabat: Matamma, *Schweinfurth*, 73! Abyssinia: Sameu; Jaja, 3000–6000 ft., *Schimper*, 302! Mai Gibba, *Rohlf's & Stecker!* Shire, *Petit!* and without precise locality, *Schimper*, 390! British East Africa: Lake Baringo, *Gregory!*

Lower Guinea. Angola: *Welwitsch*, 2014! German South-west Africa: Hereroland, 2600 ft., *Marloth*, 1251!

Also in South Africa, and extending into South-west Asia.

15. **B. Asteracanthus**, *C. B. Clarke*. Glabrescent except the inflorescence. Stems 1 ft. high, simple, straight, many-angled. Leaves in whorls of 4, subequal, up to 7 by $\frac{1}{8}$ – $\frac{1}{3}$ in., linear, entire or with very few teeth. Inflorescence a dense compound terminal spinous softly hairy head 2–3 in. in diam. Flower-bract $\frac{3}{4}$ –1 in. long, lanceolate; bracteoles $\frac{3}{4}$ in. long, linear. Posticous calyx-segment $\frac{3}{4}$ in. long; 2 inmost calyx-segments $\frac{2}{3}$ in. long, narrow-oblong, acute, mucronate. Corolla 1 in. long, very hairy.—*B. acanthodioides*, S. Moore in *Journ. Bot.* 1880, 229 partly.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, 5250 ft., *Nutt!*

16. **B. Sol**, *C. B. Clarke*. Stem glabrate, with long trailing branches. Leaves in distant whorls of 4; inner pair up to 6 by $\frac{1}{4}$ in., lanceolate, subsessile, glabrous, entire, without spines. Inflorescence up to 7 in. in diam.; floral-leaves 32, 3 by $\frac{1}{2}$ in., spinous, pubescent, spreading radially, surrounding the lax compound short cyme of many one-flowered branches (reduced spikes). Flower-bracts linear-oblong, spinous, pubescent. Two outer calyx-segments exceeding $\frac{3}{4}$ in. in length, lanceolate; 2 inner $\frac{3}{4}$ in. long, narrow-lanceolate. Corolla 1 in. long, clear yellow, minutely and sparsely pubescent. Pistil glabrate; 2 pits filled with glands at the style-base.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, 2000–3000 ft., *Whyte!*

17. **B. Buchneri**, *Lindau in Engl. Jahrb.* xx. 30. Hairy or ultimately glabrate, except the inflorescence. Stem-leaves in distant whorls of 4, whereof the 2 inner are 2-5 by $\frac{1}{8}$ - $\frac{1}{3}$ in., linear or oblong, entire or with very few obscure teeth, 2 outer reduced, $\frac{1}{2}$ -1 in. long, ovate, lobed, with spines $\frac{1}{8}$ - $\frac{1}{4}$ in. long. Inflorescence 1-1 $\frac{1}{2}$ in. in diam.; flower-bract $\frac{2}{3}$ in. long, spathulate-oblong, acute, more or less spinous towards the top; bracteoles 0. Calyx $\frac{2}{3}$ in. long, 2 inmost segments linear-lanceolate, nearly as long as the others. Corolla 1 in. long, blue.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 318. *B. acanthodioides*, S. Moore in *Journ. Bot.* 1880, 229 partly, not of Klotzsch.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5061! 5080! 5096! 5112! 5174! 5219! *Mechow*, 109! Malange, *Buchner*, 92! Caringa River, *Welwitsch*, 5163! Cambo River, *Mechow*, 547A!

South Central. Lunda: Lomani River, *Pogge*, 1217!

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, at Fort Hill, *Whyte*!

18. **B. chrysotricha**, *Lindau in Engl. Jahrb.* xx. 32. Branches and innovations white-hairy. Leaves in whorls of two very unequal pairs (*Lindau*), larger leaves 3 by 1 $\frac{2}{3}$ in., broad-elliptic, triangular at either end, mature scabrous, nearly glabrous, margin sparingly dentate; petiole $\frac{1}{2}$ in. long. Spikes 1 $\frac{1}{2}$ by 1 in., on very short lateral branchlets, few-flowered, strobilate. Flower-bracts $\frac{3}{4}$ by $\frac{2}{3}$ in., obovate, obtuse, strongly 3-nerved, nearly glabrous, with very long teeth. Posticous sepal 1-1 $\frac{1}{4}$ in. long, elliptic-oblong, nearly glabrous. Hairs of the anthers golden-brown.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 318, and in *Engl. Pfl. Ost-Afr.* C. 370.

Mozamb. Dist. German East Africa: Usagara, *Stuhlmann*, 199!

The large leaf is detached, and the statement that the four leaves are in very unequal pairs cannot be verified.

19. **B. tetrasticha**, *Lindau in Engl. Jahrb.* xx. 29. Branch 16 in. long, undivided, terete, pubescent. Leaves (exactly decussate) in equidistant alternate pairs, 1 in. long, ovate, acuminate, spinous-margined, sessile. Flowers forming a loose quasi-terminal spike 2 by 1 in.; flower-bracts 1 by $\frac{1}{2}$ in., ovate, acuminate, long-spinous on the margin; bracteoles $\frac{3}{4}$ -1 in. long, linear, softly hairy. Posticous calyx-segment 1 in. long, minutely hairy. Corolla 1 $\frac{1}{2}$ in. long.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 318.

Lower Guinea. Angola: Malange, *Buchner*, 6! Kuango River, *Mechow*, 563!

20. **B. obmitrata**, *C. B. Clarke*. Hairy or later glabrate. Leaves in apparent whorls of 4, subsimilar, 1 $\frac{1}{2}$ -2 by $\frac{1}{3}$ - $\frac{1}{2}$ in., oblong or elliptic, subsessile, margin regularly spinous-toothed. Inflorescences 1-3 $\frac{1}{2}$ by 1 in., strobilate, flower-bract 1-1 $\frac{1}{4}$ in. long, ovate-lanceolate, acuminate, rigid, spinous; bracteoles $\frac{3}{4}$ -1 in. long, linear. Posticous calyx-segment $\frac{3}{4}$ in. long; 2 inmost calyx-segments $\frac{1}{2}$ in. long. Corolla 1 in.

long, blue. Ovary with a large obversely-mitriform horny cap below the 2 glands on the posticous style-base.

Lower Guinea. Angola: Humbe, on the River Cunene, and Gambos, *Newton!* and without precise locality, *Johnston!*

Also in South Africa.

21. **B. edulis**, *Pers. Syn.* ii. 180. Grey pubescent or nearly glabrate. Stem short, rigid, branched. Leaves in fours at the sterile nodes; upper pair 2 by $\frac{1}{3}$ in., oblong or narrow-elliptic, sessile, spinous-margined; lower pair smaller but similar. Inflorescences strobilate, up to 4 in. long, sometimes short; bracts 1–1 $\frac{1}{2}$ in. long, ovate, acuminate, recurved, spinous, puberulous, more or less hairy on the nerves without when young; bracteoles linear, $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Posticous calyx-segment $\frac{1}{2}$ – $\frac{2}{3}$ in. long, broadly ovate, very hairy; 2 inmost calyx-segments $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Corolla $\frac{3}{4}$ in. long or rather more, blue. Capsule $\frac{1}{4}$ in. long or rather more, 2-seeded.—T. Anders. in *Journ. Linn. Soc.* vii. 36; *Zarb in Cat. Spéc. Bot. Pfund*, 32; *Boiss. Fl. Orient.* iv. 520; *Oliv. in Trans. Linn. Soc.* xxix. 128; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 318, fig. 126, A; in *Engl. Pf. Ost-Afr.* C. 369, and in *Ann. Istit. Bot. Roma* vi. 76. *Ruellia ciliaris*, *Linn. Mant.* 89? *R. persica*, *Burm. Fl. Ind.* 135, t. 42, fig. 1. *Acanthus edulis*, *Forsk. Fl. Ægypt.-Arab.* 114. *A. Delilii*, *Spreng. Syst.* ii. 819. *A. tetragonus*, *R. Br. in Salt, Abyss. Append.* lxxv. *Acanthodium spicatum*, *Delile, Fl. Ægypt.* 97, t. 33, fig. 2; *Nees in DC. Prod.* xi. 274; *Solms-Laub. in Schweinf. Beitr. Fl. Aethiop.* 102, 242; *Franch. Sert. Somal.* 53; *Beck in Paulit. Harar.* 459.

Nile Land. Nubia: near Suakin, *Schweinfurth*, 67! Coastland, 0–4000 ft., *Bent! Schweinfurth*, 349! between Korosko and Berber, *Kotschy*, 341! Meroe (Assur), *Speke & Grant!* Dongola, *Ehrenberg!* Kordofan, *Kotschy*, 33! Eritrea: near Saati, *Schweinfurth & Riva*, 491! Massowa, *Hildebrandt*, 723A! *Steudner!* Keren, *Steudner*, 1525! Habab, 7000 ft., *Hildebrandt*, 458! Abyssinia: Valley of Dallul, *Roth*, 479! Airuri, *Stecker*, 31! and without precise locality, *Salt!* *Schimper*, 163! Somaliland: Baraua (Brava), *Hildebrandt*, 1316! Daa River, *Riva*, 1460! Harrar, *Robecchi*, 6! and without precise locality, *Mrs. Lort-Phillips!* *Miss Edith Cole!* British East Africa: Sabaki River, *Gregory!* Ukamba, *Hildebrandt*, 2613!

Mozamb. Dist. Kilimanjaro: Marangu, 3000 ft., *Volkens*, 556!

The synonym *Ruellia ciliaris*, *Linn.*, is doubtful; *Linnæus'* description is too short.

22. **B. serrulata**, *Ficalho & Hiern in Trans. Linn. Soc. ser. 2, Bot.* ii. 24. Leaves very spinous, with forward-pointing teeth. Spikes 3–10-flowered, smaller and looser than in *B. edulis*; bracts $\frac{3}{4}$ in. long, densely short-hairy, nerves hirsute. Corolla $\frac{3}{4}$ in. long, otherwise as *B. edulis*.—*B. procumbens*, *T. Anders. in Journ. Linn. Soc.* vii. 35 partly. *Acanthodium serrulatum*, *Nees in DC. Prod.* xi. 275. *A. diversispinum*, var. *a*, only *Nees in DC. Prod.* xi. 275.

Lower Guinea. Angola: Chella Mountains, *Johnston!* Amboella; Kuando River, at Ninda, *Serpa Pinto*.

Mozamb. Dist. British Central Africa: Ngamiland; Kwebe, *Lugard*, 85!
Also in South Africa.

23. **B. Noli-me-tangere**, *S. Moore in Journ. Bot.* 1880, 231. Small shrub, very prickly, nearly glabrous except calyx and corolla. Leaves in fours, up to $1\frac{1}{2}$ by $\frac{1}{3}$ in., oblong, spinous-margined. One-flowered branches (reduced spikes) mostly solitary, sometimes 2-3 together; lowest floral-leaves (and leaves on axillary sterile shoots) reduced to simple or compound spines $\frac{1}{2}$ -2 in. long; bract 1 in. long, obovate, acuminate, spinous, puberulous or glabrescent; bracteoles $\frac{3}{4}$ -1 in. long, linear. Posticous calyx-segment $\frac{3}{4}$ in. long; 2 inmost calyx-segments $\frac{1}{3}$ in. long. Corolla 1 in. long. Capsule nearly $\frac{1}{2}$ in. long, 2-seeded.—Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 318. *B. pruinosa*, *Engl. in Engl. Jahrb.* x. 260.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 5045! German South-west Africa: Hereroland, Usakos, 3000 ft., *Marloth*, 1444! Omapiu, *Schinz*, 17!

24. **B. panduriformis**, *Lindau in Engl. Jahrb.* xx. 30. Shrubby, 8-12 in. high, hairy, afterwards glabrate except the inflorescence. Leaves up to $2\frac{1}{2}$ by $\frac{1}{6}$ - $\frac{1}{3}$ in., linear or lanceolate, spinous-margined. Inflorescence of one-flowered branches (reduced spikes) crowded in a scorpioid manner, not strobilate; floral-leaves $1-1\frac{1}{4}$ by $\frac{1}{6}$ - $\frac{1}{4}$ in., spinous-margined, pubescent; flower-bract scarcely $\frac{3}{4}$ in. long, oblong-elliptic, acute, spinous; bracteoles $\frac{1}{3}$ in. long, linear. Posticous calyx-segment $\frac{3}{4}$ -1 in. long, ovate-oblong, somewhat widened again below the apex and then truncate, finely veined in the type example, more hairy (venation less prominent) in other specimens; 2 inmost calyx-segments $\frac{1}{2}$ - $\frac{2}{3}$ in. long. Corolla $\frac{3}{4}$ -1 in. long.—Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 318, and in *Engl. Pfl. Ost-Afr.* C. 369.

Nile Land. British East Africa: Mombasa, *Wakefield*!

Mozamb. Dist. German East Africa: Karagwe; on dry hills, 4000-5000 ft., *Scott-Elliott*, 8190! Masai country, *Fischer*, 486! Uniamwezi; Urambo, *Hannington*! Irangi, *Stuhlmann*, 4226!

25. **B. acanthodioides**, *Klotzsch in Peters, Reise Mossamb.* 212. Branches erect, frequently dividing, scabrous pubescent, ultimately glabrous. Leaves up to 3 by $\frac{1}{2}$ in., lanceolate, sparingly spinous-margined, glabrate when mature. Inflorescence of many axillary clusters, each cluster of 2-6 one-flowered branches (reduced spikes); outer floral-leaves $1-1\frac{1}{2}$ by $\frac{1}{6}$ in., rigid, lanceolate, with many marginal spines, nearly glabrous; sterile bracts lanceolate, spinous, with many prominent white hairs at the top, almost obscuring the strong terminal spine; flower-bract hardly $\frac{2}{3}$ in. long, lanceolate, similar to the sterile bracts; bracteoles $\frac{2}{3}$ in. long, linear. Calyx-segments and bracteoles ended by a strong spinule, which is nearly concealed by tufts of long white hairs on the tips. Posticous segment (and anticous connate segments) $\frac{3}{4}$ in. long, elliptic-lanceolate, acute; 2 inmost segments $\frac{1}{2}$ in. long, linear. Corolla 1 in. long, or rather more, densely shaggy without by long white hairs.—Lindau in *Engl. Pfl. Ost-Afr.* C. 369 (*acanthoides*).

Mozamb. Dist. Portuguese East Africa: Rios de Sena, *Peters*! British Central Africa: Nyasaland, *Buchanan*, 18!

26. **B. longifolia**, Lindau in *Engl. Jahrb.* xx. 32. Stem stout, permanently hairy or glabrate. Leaves up to 4–6 by $\frac{1}{6}$ – $\frac{1}{2}$ in., linear or oblong. Floral-leaves densely minutely grey strigose. Tips of calyx-segments spinous, without long white hairs. Corolla blue, very thinly hairy; otherwise as *B. acanthodioides*.—Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 318, and in *Engl. Pfl. Ost-Afr.* C. 370.

Mozamb. Dist. German East Africa: East shore of Lake Tanganyika, *Scott-Elliot*, 8354! Unyamwezi; Oallo (Wala) River, *Stuhlmann*, 485! British Central Africa: Nyasaland, *Buchanan*, 696!

27. **B. diversispina**, C. B. Clarke. Grey or fuscous pubescent, afterwards glabrate. Leaves apparently 4 in a whorl, subsimilar, $1\frac{1}{2}$ by $\frac{1}{2}$ in., narrow elliptic, spinous-margined; sterile shoots in their axils (as well as the lowest floral-leaves) reduced to simple spines $\frac{1}{4}$ – $\frac{1}{2}$ in. long, passing upwards into compound spines and into floral leaves. One-flowered branches (reduced spikes) 2–6 together, axillary or themselves grouped into short ovoid spikes; flower-bract $\frac{2}{3}$ by nearly $\frac{1}{2}$ in., ovate, short-acuminate, spinous-margined, closely hairy without; bracteoles linear, $\frac{2}{3}$ in. long. Posticous sepal $\frac{3}{4}$ in. long; 2 inmost sepals $\frac{1}{4}$ – $\frac{1}{3}$ in. long, lanceolate. Corolla $\frac{3}{4}$ in. long or rather more, blue.—*B. procumbens*, T. Anders. in *Journ. Linn. Soc.* vii. 35 partly. *B. edulis*, var., S. Moore in *Journ. Bot.* 1880, 229. *Blepharis*, sp. nova, *B. eduli*, Pers. affinis, S. Moore in *Journ. Bot.* 1880, 232. *Acanthodium diversispinum*, var. β , Nees in *DC. Prod.* xi. 275.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 5014! 5019!

Mozamb. Dist. British Central Africa: Rhodesia; between Tamafofa and Yoruah Springs, *Holub*, 1143! 1144! 1145! 1146!

Also in South Africa.

In this species and its allies the axillary sterile shoots, above the 4-whorled leaves, begin with simple spines (in place of leaves) and develop into the flower-spikes of the next season, at the foot of which these simple spines persist as the lowest floral-leaves. The very different group of *Blepharis*, wherein the lower pair of each whorl of 4 stem-leaves is reduced to compound (or even simple) spines, has been confused herewith.

28. **B. grandis**, C. B. Clarke. Branches stout, glabrate. Leaves in distant whorls of 4 (outer pair rather shorter) up to $5\frac{1}{2}$ by 1 in., spinous-margined, glabrous; petiole $\frac{1}{3}$ in. long. Heads of 1-flowered branches (reduced spikes) several, axillary and terminal, 2–3 in. in diam., globose, dense, softly hairy; bracts lanceolate, softly spinous; bracteoles $\frac{1}{2}$ in. long, linear. Two outer calyx-segments $\frac{3}{4}$ in. long, lanceolate; 2 inner $\frac{2}{3}$ in. long, narrow-lanceolate. Corolla $1\frac{1}{4}$ in. long, fine blue, shortly hairy within and without. Pistil glabrate; 2 pits filled with glands at the style-base.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, 2000–3000 ft., *Whyte*! Nyika Plateau, 6000–7000 ft., *Whyte*! 125! Kondowe and Karonga, 2000–6000 ft., *Whyte*!

29. **B. pungens**, Klotzsch in *Peters, Reise Mossamb.* 211, t. 33. Branched suberect shrub, 1–3 ft. high, pubescent, afterwards glabrate.

Leaves up to 2 by $\frac{1}{5}$ in., spinous-margined, with many minute gland-tipped hairs. One-flowered branches (reduced spikes) axillary, solitary, scattered, and in the upper axils approximated; flower-bract $\frac{3}{4}$ in. long, narrow-elliptic or oblong, spinous-margined; bracteoles 0. Calyx $\frac{3}{4}$ in. long, minutely hairy, veins conspicuous; 2 inmost segments $\frac{2}{3}$ in. long, linear-lanceolate. Corolla 1 in. long or rather more.—Lindau in Engl. Pfl. Ost-Afr. C. 369. *B. Stuhlmanni*, Lindau in Engl. Jahrb. xx. 31, in Engl. & Prantl, Pflanzenfam. iv. 3 B. 318, and in Engl. Pfl. Ost-Afr. C. 370.

Mozamb. Dist. German East Africa: Manjansa Brook, *Stuhlmann*, 678! Muansa, *Stuhlmann*, 4596! Portuguese East Africa: Tete, *Kirk*! *Carvalho*! *Peters*! near Banga, *Kirk*, 286!

Imperfectly known species.

30. **B. Phillipseæ**, *Rendle in Journ. Bot.* 1897, 375. Woody, much-branched, canescent small shrub. Leaves apparently in false whorls of 4, $\frac{1}{5}$ in. long, oblong or elliptic, obtuse, mucronate, not spinous, thick, minutely grey scabrid. One-flowered branches (reduced spikes) solitary, axillary; lower empty bracts about 8, decussate, up to $\frac{2}{5}$ in. long, oblanceolate, tipped with 3–1 spines. Corolla $\frac{3}{4}$ in. long.

Nile Land. Somaliland: Bihen, *Mrs. Lort-Phillips*!

If the bracteoles are 0, as may be inferred from Rendle's description, this species would be near *B. boerhaaviæfolia*.

31. **B. trinervis**, *Dewèvre in Comptes-rendus Soc. Bot. Belg.* xxxiii. 104 (*name only*). Leaf $1\frac{1}{4}$ by $\frac{3}{4}$ in., obovate-elliptic, obtuse, sessile, 3-nerved, spinous-margined, softly hairy. Flowers sessile, softly hairy; bract $\frac{3}{4}$ in. long, elliptic, acute, spinous, hairy. Corolla scarcely $\frac{3}{4}$ in. long.

South Central. Congo Free State: Upper Congo; Katanga, *Cornet*, Busumba, *Dewèvre*!

This may be any *Blepharis*. The species was founded on the above-described insufficient fragments.

26. **ACANTHUS**, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1090.

Calyx sub-4-partite to the base; 2 anticous segments connate high up or quite to the tip; posticous segment lanceolate or oblong, 3-nerved; 2 interior segments narrower. Corolla; posticous lip 0, represented by a thickened sinus at the level of insertion of the stamens; anticous lip nearly flat, 3–5-lobed; middle (anticous) segment outside in bud. Stamens 4, subsimilar; filaments glabrous; anthers 1-celled, oblong, muticous, fringed with white hairs; pollen ellipsoid with 3 narrow longitudinal chinks. Ovary with 2–1 ovules in each cell, glabrous; style glabrous, except in *A. eminens*; branches 2, subequal, short-lanceolate or very small. Capsule ellipsoid, woody, shining brown, 2- (rarely 4-) seeded; seeds discoid, without hairs.—Shrubs or small trees. Leaves pinnatifid or entire, prickly or not. Flowers usually large, in long or short spikes; bract ovate, spinous or unarmed, or 0;

bracteoles 2, ovate, spinous or unarmed, or linear, or 0. A genus very close to *Blepharis*, which is absolutely separated by the hairy seeds.

Species 8 or 10, extending from South Europe and Africa to Malaya, Australia, and Polynesia.

Bracts very spinous; pollen oblong-ellipsoid; seeds shining brown.

Leaves spinous, lobed, often subpinnatifid.

Anticous calyx-segment 1 in. long, with entire tip 1. *A. arboreus*.

Anticous calyx-segment $\frac{3}{4}$ in. long, shortly 2-lobed.

Lobes of anticous calyx-segment short, rounded. 2. *A. eminens*.

Lobes of anticous calyx-segment ending in short

spines 3. *A. montanus*.

Leaves serrate, hardly lobed 4. *A. Barteri*.

Leaves subentire.

Leaves elongate, obovate-lanceolate 5. *A. mayaccanus*.

Leaves elliptic, short acuminate.

Anticous calyx-segment nearly 1 in. long 6. *A. latisepalus*.

Anticous calyx-segment $\frac{1}{3}$ – $\frac{1}{2}$ in. long 7. *A. Dusenii*.

Bracts not spinous on the margin; pollen short-ellipsoid

(subglobose); seeds corrugated 8. *A. ilicifolius*.

1. **A. arboreus**, *Forsk. Flor. Ægypt.-Arab.* 115. Pubescent or glabrate, stout shrub 3–19 ft. high. Leaves up to 12 by 6 in. (often only half this size), pinnatifid half-way down, or lobate with doubly spinous margin; petiole 0– $\frac{1}{2}$ in. long. Spikes 3–1, terminal, up to 6–10 by 2 in., often pubescent or hairy; bracts $1\frac{1}{2}$ by $\frac{1}{2}$ in., ovate-lanceolate, acuminate, with many strong spines on the margin $\frac{1}{5}$ in. long; bracteoles $1\frac{1}{4}$ by $\frac{1}{6}$ in., spinous on the margins. Posticous calyx-segment exceeding 1 in. in length, lanceolate, 3-nerved, spine-tipped; anticous calyx-segment exceeding 1 in. in length, lanceolate, 2-nerved; 2 inmost calyx-segments $\frac{3}{4}$ in. long, elliptic-lanceolate, mucronate. Corolla $1\frac{3}{4}$ in. long, rose or pale-purple. Capsule $\frac{3}{4}$ by $\frac{1}{3}$ in.—T. Anders. in *Journ. Linn. Soc.* vii. 37; Engl. *Hochgebirgsfl. Trop. Afr.* 390; Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 319. *A. arboreus*, var. *pubescens*, T. Thoms. in Speke, *Nile Append.* 643; Oliv. in *Trans. Linn. Soc.* xxix. 129, t. 86. *A. polystachius*, Delile, *Cent. Pl. Afr.* 62, t. 1, fig. 2. *A. pubescens*, Engl. *Hochgebirgsfl. Trop. Afr.* 390; Lindau in Engl. *Pfl. Ost-Afr.* C. 370, and in *Ann. Istit. Bot. Roma* vi. 76. *A. Gaëd*, Lindau in Engl. *Jahrb.* xx. 33, and in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 319. *Cheilopsis arborea*, Nees in DC. *Prod.* xi. 272. *Ch. polystachya*, Moq.-Tand. in *Ann. Sc. Nat. sér. 1*, xxvii. 230; Nees in DC. *Prod.* xi. 272; A. Rich. *Tent. Fl. Abyss.* ii. 151; Solms-Laub. in *Schweinf. Beitr. Fl. Aethiop.* 243. *Ch. Steudneri*, Solms-Laub. in *Schweinf. Beitr. Fl. Aethiop.* 243 in obs. *Dilivaria ? polystachya*, Endl. *Gen.* 703.

Nile Land. Upper Senaar: Fazokl, *Kotschy*, 489! Abyssinia: Dembea; Gondar, *Steudner*, 1532! Begemeder; near Gafat, *Steudner*, 1533! *Schimper*, 1534! Amora-Gettel, *Schimper*, 1535! and without precise locality, *Plowden*! Somaliland: Coromma, *Riva*, 621! between Algehe and Oi, *Riva*, 1265! Maid, 5000–6000 ft., *Hildebrandt*, 1399! British East Africa: Uganda, *Wilson*, 94! *Stuhlmann*, 1350! Kavirondo; Nandi Range, *Scott-Elliot*, 7057! Victoria Nyanza, *Stuhlmann*, 895!

South Central. Congo Free State: Kirunga Volcano, north of Lake Kivu, 6600 ft., *Götzen*, 24!

Mozamb. Dist. German East Africa: Karagwe, 4500 ft., *Stuhlmann*, 1764! Marara, *Fischer*, 488! Usui, *Speke & Grant*, 136!

Also in Arabia.

The measurements given in the above description are from *Kotschy*, 489, an unusually fine example, and the size of the leaves, calyx and flowers, runs down in other examples till we reach *A. Gaëd*, Lindau, from 5000 ft. alt., where the dimensions are scarcely $\frac{2}{3}$ those of *Kotschy*, 489. As regards hairiness, the examples become usually glabrate except the inflorescence; but in *Steudner*, 1532, the well-matured leaves are densely woolly beneath with several-celled white hairs, and have similar hairs scattered above. There are examples intermediate in hairiness between this example and the ordinary *A. arboreus*; I cannot characterise even a variety here; the adjacent species are equally variable as to hairiness.

2. **A. eminens**, C. B. Clarke. Glabrate, 6–8 ft. high. Inflorescence pubescent. Leaves 10 by 4 in., pinnatifid, spinous, petiole hardly any. Spike 9 by $2\frac{1}{2}$ in.; bracts scarcely 1 in. long, ovate, hardly acute, with several spines on the margin; bracteoles $\frac{1}{4}$ in. long, subulate, not spinous. Calyx soft, not spinescent; posticous segment $1\frac{1}{5}$ by nearly $\frac{1}{2}$ in., broadly oblong, not lanceolate upwards; anticous segment the same size and shape, 2-nerved, minutely emarginate at the tip; 2 inmost segments $\frac{2}{3}$ – $\frac{3}{4}$ in. long, lanceolate. Corolla 2 in. long, purple (*Scott-Elliott*). Ovary large, with hemispheric cap; style in the lower half densely short hairy.

Nile Land. British East Africa: Mau, 8000 ft., *Scott-Elliott*, 6926!

3. **A. montanus**, T. Anders. in *Journ. Linn. Soc.* vii. 37. Glabrous or hairy. Calyx $\frac{3}{4}$ –1 in. long; anticous segment with 2 spinous lanceolate lobes at the tip; otherwise nearly as *A. arboreus*.—*Bot. Mag.* t. 5516; S. Moore in *Journ. Bot.* 1880, 232; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 319. *A. caudatus*, Lindau in *Engl. Jahrb.* xx. 33, and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 319. *Cheilopsis montana*, Nees in *DC. Prod.* xi. 272; Benth. in *Hook. Niger Fl.* 481.

Upper Guinea. Sierra Leone: Kofu Mountain, *Scott-Elliott*, 4619! Lagos, Rowland! *Millen*, 101! 203! Yoruba, *Millson*, 17! Fernando Po: on mountains, *Vogel*, 239! 2000 ft., *Mann*, 639! Cameroons: Rio del Rey, *Johnston*! Victoria, *Preuss*, 1354! Barombi, *Preuss*, 487!

Lower Guinea. Princes Island, *Barter*, 2036! Gaboon: Munda; Sibange Farm, *Soyaux*, 300! *Buchholz*! Angola: Pungo Adongo, *Welwitsch*, 5076! 5167! Cambo River, *Mechow*, 500! and without precise locality, *Curror*!

South Central. Lunda: Lulua River, *Pogge*, 313! 1004!

Mozamb. Dist. British Central Africa: Nyasaland; Masuku Plateau, 6500–7000 ft., *Whyte*!

This species, usually 3 ft. high, is very close to *A. arboreus*. The flowers and capsules are larger than in many examples of *A. arboreus*. In the type examples, the leaves are “caudate.” As to hairiness, in *Scott-Elliott*, 4619, one inflorescence is very sparingly pubescent, in the other the bracts are conspicuously hirsute with many patent long white hairs.

4. **A. Barteri**, *T. Anders. in Journ. Linn. Soc.* vii. 37. Leaves 8 by $3\frac{1}{2}$ in., broad-elliptic, short-acuminate at both ends, not at all lobed, margin rather remotely and regularly toothed; teeth $\frac{1}{8}$ in. long, triangular mucronate; otherwise as *A. montanus*.

Upper Guinea. Lagos, *Millen*, 121! Lower Niger, Onitsa, *Barter*, 1300!

5. **A. mayaccanus**, *Büttner. in Verh. Ver. Brandenb.* xxxii. [1890] 37. Shrub apparently subscandent, pubescent, afterwards glabrate. Leaves 10 by 3 in., narrowly obovate-lanceolate, acute, entire, sessile, with long tapering base. Spike 4 by $1\frac{1}{4}$ in.; bracts 1 in. long, ovate, with several long marginal spines; bracteoles $\frac{3}{4}$ in. long, subulate, not spinous. Calyx exceeding 1 in. in length, not spinous; anticous segment 1 in. long, narrow-elliptic, prolonged into an oblong apical portion; tip very shortly and bluntly 2-lobed; 2 inmost segments broad-lanceolate, caudate, acuminate. Corolla $1\frac{1}{4}$ in. long.

South Central. Lunda: in thickets by the Kuango River, near Kassongo, *Büttner*, 355!

6. **A. latisepalus**, *C. B. Clarke*. Nearly glabrous. Leaves up to 5 by $2\frac{1}{4}$ in., elliptic, rather suddenly narrowed at either end; margin undulate, hardly toothed; petiole $\frac{2}{3}$ in. long. Spike 3 by 1 in. Bracts $\frac{2}{3}$ by $\frac{1}{2}$ in., rhomboidal subovate, with several long marginal innocuous spines; bracteoles $\frac{3}{4}$ in. long, linear, without spines. Posticous sepal 1 by nearly $\frac{1}{3}$ in., oblong-quadrate, wide at the emarginate top, 3-nerved, beautifully veined; 2 anticous sepals connate nearly $\frac{2}{3}$ their length, ending in 2 lanceolate-subulate teeth. Corolla nearly 1 in. long, white, purple-veined (*Bates*). Capsule $\frac{3}{4}$ in. long.

Lower Guinea. Gaboon, Mfoa, *Bates*, 533!

Nearly allied to *A. mayaccanus*, but the posticous sepal is $\frac{1}{4}$ – $\frac{1}{3}$ in. wide at the top.

7. **A. Dusenii**, *C. B. Clarke*. Shrub, nearly glabrous; innovations and axis of inflorescence minutely grey-hairy. Leaves $9\frac{1}{2}$ by $2\frac{1}{2}$ in., elliptic, acuminate at either end, entire margin undulate, thin, green; primary nerves 19 pairs; petiole $1\frac{1}{2}$ in. long. Spike terminal, 5 by 1 in., 28-flowered; bracts $\frac{1}{4}$ in. long, lanceolate, acuminate; bracteoles nearly $\frac{1}{2}$ in. long, elliptic, obtuse. Calyx-segments 4, $\frac{1}{3}$ in. long, sub-equal in length; anticous segment elliptic, notched at the tip $\frac{1}{4}$ – $\frac{1}{3}$ its length. Corolla-tube $\frac{2}{5}$ in. long; upper lip 0. Capsule $\frac{2}{5}$ in. long, with 2 ellipsoid, flat, quite smooth seeds (*Lindau*).—*Pseudoblepharis Dusenii*, *Lindau in Engl. Jahrb.* xx. 34, and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 319.

Upper Guinea. Cameroons, *Dusen*, 348A!

8. **A. ilicifolius**, *Linn. Sp. Plant.* ed. ii. 892. Shrub 1–5 ft. high, glabrous or very nearly so. Leaves 4–7 by 1–3 in., pinnatifid or lobed, spinous (scarcely spinous or quite entire leaves occur), nearly sessile. Spikes 6 by $1\frac{1}{2}$ in.; bracts $\frac{1}{3}$ in. long, ovate; bracteoles $\frac{1}{4}$ in. long, triangular-lanceolate. Calyx of 4 separate segments; anticous (representing

2 connate) and posticous nearly alike, $\frac{1}{2}$ – $\frac{2}{3}$ by $\frac{1}{3}$ in., round-ovate, many-nerved, glabrous, with papery margin; 2 lateral inmost segments shorter, much narrower, broad-lanceolate, subobtuse. Corolla $1\frac{1}{4}$ – $1\frac{3}{4}$ in. long, blue. Capsule 1 by $\frac{1}{2}$ in.; seeds large, white, with close brain-like corrugations.—T. Anders. in Journ. Linn. Soc. vii. 36; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 481. *Dilivaria ilicifolia*, Nees in Wall. Pl. As. Rar. iii. 98, and in DC. Prod. xi. 268; Wight, Ic. t. 459.

Mozamb. Dist. South-east Africa, ex *Lindau*.

Also in South Africa, and extending into Southern Asia and Polynesia.

27. **SCLEROCHITON**, Harvey; Benth. et Hook. f. Gen. Pl. ii. 1090.

Calyx large, divided to the base; segments 5, not spinous, all of equal length, or the posticous larger. Corolla-limb of 5 segments on one side; tube of moderate length, nearly entire or split on the posticous side down nearly to the level of insertion of the stamens, with acute sinus; middle (anticous) segment entirely without in the bud. Stamens 4, subsimilar; filaments glabrous; anthers exerted, 1-celled, from short semicircular and glabrous to long oblong and hairy on the margins; pollen globose or subquadrate (seen from the side, subtrigonus in section), with 3 narrow longitudinal chinks. Ovary with 2–1 ovules in each cell, glabrous; style glabrous; branches 2, subequal, short lanceolate. Capsule ellipsoid, woody, shining brown, 2–4-seeded; seeds discoid, ridged, ridges scabrous, not hairy.—Shrubs, nearly glabrous. Leaves elliptic, narrowed at both ends, entire. Flowers in short spikes (in *S. nitidus* in long spikes); bract ovate or 0; bracteoles 2, ovate, entire, shorter than calyx.

Species 8, in Tropical and South Africa.

A well-marked genus; *Crossandra* is known at sight by the included anthers and by the calyx. *S. nitidus* approximates to *Acanthus* by the inflorescence and the hairy margin to the bracts, but on account of the calyx being in 5 separate pieces it is placed here. The pollen is very uniform throughout the species; the side view is very square in *S. harveyanus* (the type and some other species), nearly circular in *S. Vogelii* and *S. nitidus*. Lindau lays stress, as a generic character, on the 3-rayed star at the pole in *Pseudoblepharis*, Baillon; in *Sclerochiton Kirkii* and *S. Vogelii* this polar star is well marked, but obscure or obsolete in other species.

Calyx-segments nearly equal in length.

Bracts glabrous.

Calyx 1 in. long; leaves hardly petioled 1. *S. Kirkii*.

Calyx $1\frac{1}{2}$ in. long; leaves distinctly petioled 2. *S. Preussii*.

Bracts hairy on the margin; spike long 3. *S. nitidus*.

Posticous calyx-segment longer than the others.

Posticous calyx-segment obovate, obtuse 4. *S. Boivini*.

Posticous calyx-segment elongate, lanceolate.

Posticous calyx-segment $\frac{1}{2}$ in. wide; internodes long 5. *S. Vogelii*.

- Posticous calyx-segment $\frac{1}{4}$ in. wide; internodes short 6. *S. Holstii*.
 Posticous calyx-segment with linear oblong obtuse tip . 8. *S. obtusisepalus*.
 Posticous calyx-segment ending in 2 lanceolate acute teeth 7. *S. scissisepalus*.

1. **S. Kirkii**, *C. B. Clarke*. Glabrous shrub. Leaves up to $12\frac{1}{2}$ by 4 in., base decurrent to the foot of the petiole. Spikes terminal, 2 in. long, 6–8-flowered; peduncle $\frac{1}{2}$ in. long; bract $\frac{3}{4}$ by $\frac{1}{2}$ in., quadrate, shining, almost horny; bracteoles $\frac{2}{3}$ by $\frac{1}{3}$ in., similar to bract. Calyx-segments 5 of equal length; posticous 1 by nearly $\frac{1}{3}$ in., triangular-lanceolate, acute, shining, many-nerved; others much narrower. Corolla $1\frac{1}{2}$ in. long. Anthers long, hairy.—*Acanthus Kirkii*, T. Anders. in Journ. Linn. Soc. vii. 37; S. Moore in Journ. Bot. 1880, 233; Lindau in Engl. Pfl. Ost-Afr. C. 370.

Mozamb. Dist. Portuguese East Africa: Morambala Mountain, 2000 ft., *Kirk!*

2. **S. Preussii**, *C. B. Clarke*. Leaves up to 9 by $3\frac{1}{2}$ in., base tapering into the petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Bract nearly 1 by $\frac{1}{2}$ in., quadrate, shining; bracteoles 1 by $\frac{1}{3}$ – $\frac{1}{2}$ in., quadrate-oblong. Calyx $1\frac{1}{2}$ in. long (rather more in fruit), of 5 equally-long separate pieces; posticous segment nearly $\frac{1}{2}$ in. broad, entire, shining, many-nerved; others much narrower. Capsule $\frac{3}{4}$ by $\frac{1}{3}$ in.—*Pseudoblepharis Preussii*, Lindau in Engl. Jahrb. xx. 34, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319, fig. 112, A, B.

Upper Guinea. Cameroons: North-west Buea, *Preuss*, 1073!

This is very near *S. Kirkii*.

3. **S. nitidus**, *C. B. Clarke*. Nearly glabrous shrub. Leaves up to 8 by $2\frac{1}{4}$ in., narrowed at both ends; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Spike $3\frac{1}{2}$ by 1 in., terminal, subsessile; bracts $\frac{3}{4}$ by $\frac{1}{3}$ in., elliptic, acute, concave, minutely hairy, margins white-hairy; bracteoles $\frac{1}{2}$ by $\frac{1}{4}$ in. Calyx $\frac{3}{4}$ in. long, of 5 separate pieces. Posticous segment elliptic, acute; others narrower. Corolla 1 in. long, light violet (*S. Moore*). Anthers long, hairy; pollen globose.—*Acanthus nitidus*, S. Moore in Journ. Bot. 1880, 232. *Pseudoblepharis nitida*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319.

Lower Guinea. Angola: Pungo Adongo, *Welwitsch*, 5087! 5100!

This plant recedes from the genus in the long spike with silky margins to the sepals.

4. **S. Boivini**, *C. B. Clarke*. Glabrous. Branches thick, woody, with short nodes. Leaves 4 by 1 in., elliptic, narrowed at both ends; petiole $\frac{1}{4}$ in. long. Spikes terminal on short lateral branches, short, few-flowered, or sometimes 3 in. long and 20-flowered; bract $\frac{3}{4}$ by $\frac{1}{2}$ in., elliptic; bracteoles $\frac{3}{4}$ by $\frac{1}{4}$ in., oblanceolate, subacute. Posticous calyx-segment $1\frac{1}{3}$ by $\frac{1}{2}$ in., narrowly obovate, obtuse or emarginate, many-nerved; others 1 by $\frac{1}{3}$ in., subacute. Corolla, hardly exceeding the

calyx, altogether of the genus. Anthers short, glabrous; base of style obscurely articulated on the ovary, microscopically pubescent—*Pseudoblepharis Boivini*, Baillon in Bull. Soc. Linn. Paris, ii. [1890] 837, and Hist. Pl. x. 457; Lindau in Engl. Jahrb. xviii. 63, t. 1, fig. 39, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319. *P. Heinsenii*, Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 306, and in Engl. Jahrb. xxiv. 320.

Nile Land. British East Africa: Mombasa, *Boivin! Wakefield!* Nyika country, near Mombasa, *Wakefield!*

Mozamb. Dist. German East Africa: Usambara, Handei Mountains, *Heinsen, 4!*

The locality, West Africa, given by Lindau is presumed an error.

5. **S. Vogelii**, T. Anders. in Journ. Linn. Soc. vii. 37. Nearly glabrous; branches straight, terete, with long internodes. Leaves 4 by $1\frac{1}{4}$ in., tapering at both ends; petiole hardly any. Spikes $1\frac{1}{2}$ –2 in. long, terminal on short lateral branches; rhachis microscopically pubescent; bract $\frac{1}{2}$ in. long, elliptic, acute; bracteoles $\frac{1}{2}$ in. long, linear-lanceolate. Calyx 1 – $1\frac{1}{4}$ in. long; segments 5, all linear-lanceolate; posticous segment longer than the others, tip entire. Corolla $1\frac{1}{4}$ in. long. Anthers long, sparsely hairy. Capsule $\frac{1}{2}$ by $\frac{1}{5}$ in.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 316. *Isacanthus Vogelii*, Nees in DC. Prod. xi. 279; Benth. in Hook. Niger Fl. 481.

Upper Guinea. Liberia: Cape Palmas, *Vogel, 54! Ansell!*

6. **S. Holstii**, C. B. Clarke. Branches woody, slender, crooked with approximate nodes. Posticous calyx-segment $1\frac{1}{4}$ by $\frac{1}{4}$ in.; otherwise as *S. Vogelii*.—*Pseudoblepharis Holstii*, Lindau in Engl. Jahrb. xx. 35; in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319, and in Engl. Pfl. Ost-Afr. C. 370.

Mozamb. Dist. German East Africa: Usambara; Amboni, *Holst, 2885!* Tanga, *Heinsen, 149!*

It has been doubted whether this is specifically distinct from *S. Vogelii*. The habit of the almost gnarled slender branches is different, the posticous calyx-segment is twice as broad at least, and the habitat is remote.

7. **S. scissisepalus**, C. B. Clarke. Bracteoles $\frac{3}{4}$ by $\frac{1}{5}$ in., lanceolate, aristate. Posticous calyx-segment ending in 2 lanceolate teeth, many-nerved; other calyx-segments caudate-aristate. Anther-cells short-oblong, nearly glabrous; pollen very shortly ellipsoid; otherwise as *S. Holstii*.

Nile Land. British East Africa: Nyika country near Mombasa, *Wakefield!*

The nodose crooked branches and inflorescence are altogether like those of *S. Holstii*; the calyx is very minutely pubescent, as also the rhachis of the spike. There is only one good flower; but the bifid tip to the posticous calyx-segment is remarkable, and indicates an approximation to *Crossandra*.

8. **S. obtusisepalus**, C. B. Clarke. Shrub, glabrous or nearly so. Leaves $4\frac{1}{2}$ by $1\frac{1}{2}$ in., elliptic, base tapering, apex shortly caudate to

obtuse; petiole $\frac{1}{5}$ in. long. Heads $1\frac{1}{4}$ in. in diam., about 8-flowered, lax; pedicels $\frac{1}{12}$ in. long, minutely pubescent; bract at base of the pedicel $\frac{1}{4}$ in. long, ovate; bracteoles (close to calyx) $\frac{1}{3}$ in. long, elliptic acute. Posticous sepal exceeding $\frac{3}{4}$ in. in length, tip oblong $\frac{1}{10}$ in. wide, obtuse, toothed; 2 anticous sepals $\frac{2}{3}$ in. long, lanceolate, acute, sometimes with a lateral tooth; 2 interior sepals nearly as the anticous. Corolla 1 in. long. Anthers broad-oblong, thinly hairy.

Mozamb. Dist. British Central Africa; Nyasaland; Masuku Plateau, 6500–7000 ft., *Whyte*, 267!

28. **CROSSANDRA**, Salisb.; Benth. et Hook. f. Gen. Pl. ii. 1094.

Calyx 5-partite to the base; 2 anticous segments oblong, acute, 1-nerved; posticous segments broader, 2-nerved, often 2-toothed; 2 inmost segments lanceolate or linear. Corolla orange-yellow or light-red; tube long linear, much longer than the limb; limb of 5 segments, imbricate in bud, turned to one side in the expanded flower. Stamens 4, subsimilar; filaments short, glabrous; anthers 1-celled, included in the linear corolla-tube, oblong, muticous; pollen oblong, usually narrow-oblong, square-headed, with 3 (often very slender) longitudinal chinks. Ovary oblong, with 2 ovules in each cell, glabrous or scarcely hispid at the tip; style glabrous or thinly hairy; stigma dilated, obscurely 2-fid, more or less trumpet-mouthed. Capsule oblong-ellipsoid, usually 4-seeded; seeds covered with tufts of hairs or adpressed scales fringed with tufts of hairs each spirally thickened within and slightly hygroscopic.—Shrubs. Leaves entire. Flowers in strobilate, often long-peduncled spikes; bract large, ovate, pubescent or papery, subglabrous; bracteoles linear or lanceolate, as long as the calyx (except in *C. pungens*).

Species 14, African or Mascarene, 1 of these extending to India.

In many genera of *Acanthaceæ*, the two anticous calyx-segments are more or less connate, often nearly or quite to the tip, forming a 2-nerved, sometimes apparently simple segment. In *Crossandra*, in the posticous segment, the central nerve has died quite away, occasionally a trace near the base remains, while 2 lateral nerves are developed so that the tip of the segment is 2-spined or more or less 2-lobed; its state might be compared to that of the palea in grasses; and it so extraordinarily simulates the much more common connate 2-sepalous anticous calyx-segment that it is not strange that Bentham (in Gen. Pl.) and Lindau in Engler's *Pflanzenfam.* have taken it for the anticous calyx-segment.

* Bract herbaceous, ovate, short-acuminate, hairy at least on the margin.

Bract with several subulate teeth on the margin.

Spikes peduncled.

Stem leafy; corolla orange, tube $\frac{3}{4}$ in. long . . . 1. *C. Greenstockii*.

Stem short; corolla yellow, tube $1\frac{1}{4}$ in. long . . . 2. *C. flava*.

Spikes sessile. Leaves all close to the spike . . . 3. *C. stenostachya*.

Bract with a mucronate or spinous tip, but no long teeth on the margin.

Spike nearly glabrous; bract 3–1-toothed . . . 4. *C. tridentata*.

Spike hairy.

- Bract broad ovate, densely ciliate on the margin . . . 5. *C. pungens*.
 Bract lanceolate, with spreading white hairs . . . 6. *C. spinosa*.
 Bract entire, pointed, hardly spine-tipped or mucronate.
 Branches elongate with many nodes and branchlets.
 Branches hairy; bracts silky-hairy.
 Petioles up to $\frac{1}{2}$ –1 in. long 7. *C. nilotica*.
 Leaves sessile 8. *C. leikipiensis*.
 Branches sparingly hairy; bracts nearly glabrous . . . 9. *C. mucronata*.
 Branches $\frac{1}{2}$ –2 in. long; peduncles very long.
 Bracts elliptic, short acuminate, plicate . . . 10. *C. subacaulis*.
 Bracts obovate-oblong, obtuse, not plicate . . . 11. *C. primuloides*.
 ** Bract papery, lanceolate, nearly glabrous.
 Leaf-base obtuse; spike slender, elongate . . . 12. *C. guineensis*.
 Leaf-base spathulate; spike moderately dense . . . 13. *C. puberula*.

1. **C. Greenstockii**, *S. Moore in Journ. Bot.* 1880, 37. Pubescent. Stems 6–12 in. long, several from the short woody rootstock. Leaves 1–6 in. long, narrowly elliptic, tapering to the base. Peduncles 0–6 in. long; spikes 1–6 by $\frac{3}{4}$ –1 in., dense; bract $\frac{3}{4}$ in. long, herbaceous, ovate, hairy, margins with several innocuous spinous teeth; bracteoles linear, longer than the calyx. Posticous calyx-segment $\frac{1}{4}$ in. long, 2-nerved, tip with 2 spinous hairy teeth. Corolla red (*S. Moore*); tube $\frac{3}{4}$ in. long; segments $\frac{1}{2}$ in. long. Anthers slightly hairy. Style glabrous, except a few hairs at the base. Capsule $\frac{2}{3}$ by $\frac{1}{4}$ in., 4-seeded; seeds covered with tufts of white hairs, hardly scaly.—*S. Moore in Trans. Linn. Soc. ser. 2, Bot. iv. 31*; *Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319*, and in *Engl. Pfl. Ost-Afr. C. 370*.

Mozamb. Dist. British Central Africa: Nyasaland; Shire Highlands, *Buchanan*, 15! Manganja Hills, *Meller*! Mount Mlanje, *Whyte*! McClounie, 63! *Scott-Elliot*, 8635! and without precise locality, *Buchanan*, 76! 419! 590! 919 1387!

Also in South Africa.

The dried material appears to be tufts of flowering shoots springing from woody stocks after fire.

2. **C. flava**, *Hook. Bot. Mag. t. 4710*. Pubescent. Stems 2–8 in. long. Leaves up to 8 by $1\frac{3}{4}$ in., narrowly elliptic, long-tapering at the base, often very coarsely undulate; petiole up to $\frac{1}{2}$ – $1\frac{1}{2}$ in. long. Peduncle 1–3 in. long; spike 1–2 by $1\frac{1}{2}$ in., dense; bract 1 in. long, herbaceous, ovate, hairy, margins with several innocuous spinous teeth; bracteoles linear, longer than the calyx. Posticous calyx-segment $\frac{1}{2}$ in. long, 2-nerved, tip of 2 lanceolate hairy lobes. Corolla clear yellow; tube $1-1\frac{1}{4}$ in. long, very slender; segments $\frac{1}{3}$ in. long. Style very thinly hairy.—*Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319*.

Upper Guinea. Sierra Leone: Sugarloaf Mountain, *Whitfield*! *Don*! Lagos, *Millen*, 122! Yoruba, *Millson*!

3. **C. stenostachya**, *C. B. Clarke*. Pubescent. Stem 12 in. long, simple, leafless below. Leaves in a terminal rosette up to 5 by $1\frac{1}{2}$ in.,

narrowly obovate, obtuse; base tapering; petiole 0. Spike 3 in. long, sessile, very dense; bracts $\frac{1}{2}$ in. long, subrhomboidal, spinous-ciliate on the margins upwards, white hairy; bracteoles rather less than $\frac{1}{2}$ in. long, linear. Calyx-segments 5; posticous $\frac{2}{3}$ in. long, lanceolate, 2-nerved, ending in 2 lanceolate hairy subspinescent points. Corolla yellow; tube more than $\frac{1}{2}$ in. long, linear, altogether of *Crossandra*, but very slender. Anthers included in the corolla-tube, 1-celled; pollen twice as long as broad.—*Sclerochiton stenostachyus*, Lindau in Engl. Jahrb. xx. 27, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 316, and in Engl. Pfl. Ost-Afr. C. 369.

Nile Land. British East Africa: Ukamba, *Hildebrandt*, 2720!

The pollen as described by Lindau will not do for *Sclerochiton*.

4. **C. tridentata**, *Lindau in Engl. Pfl. Ost-Afr. C.* 370. Glabrous; innovations minutely pubescent. Stems 6 in. high. Leaves up to 6 by $1\frac{1}{4}$ in., narrowly elliptic, tapering at both ends, tip obtuse; petiole $\frac{1}{2}$ in. long or 0. Spike peduncled, ovoid, $1\frac{1}{2}$ in. long; bract $\frac{2}{3}$ in. long, herbaceous, very sparsely hairy, ovate, tip lanceolate mucronate with sometimes a small mucro on each side; bracteoles lanceolate-linear, longer than the calyx. Posticous calyx-segment nearly $\frac{1}{3}$ in. long, broadly ovate, 2-nerved, tip with 2 subglabrous mucronate teeth. Corolla-tube $\frac{2}{3}$ in. long. Anthers subglabrous; pollen oblong-ellipsoid, 3-ribbed. Style thinly hairy.—*Lindau in Engl. Jahrb.* xxiv. 320.

Mozamb. Dist. German East Africa: Kilimanjaro; above Useri, 6500 ft., *Volken*, 1994!

5. **C. pungens**, *Lindau in Engl. Jahrb.* xx. 36. Pubescent. Stem 6–12 in. high. Leaves up to 7 by $1\frac{1}{2}$ in., narrowly elliptic, long-tapering and coarsely undulate at the base. Spikes 2–6 by $\frac{3}{4}$ in., extremely dense; bract $\frac{3}{4}$ in. long, or rather more, broadly ovate, hairy, tip definitely spinous, margin hairy and scarcely spinous; bracteoles hardly $\frac{1}{2}$ the length of the calyx, broadly lanceolate. Posticous calyx-segment $\frac{1}{5}$ in. long, broadly ovate, 2-nerved; its tip emarginate, hairy, hardly toothed. Corolla-tube nearly 1 in. long; lobes $\frac{1}{2}$ in. long, appearing to have been pale red. Anthers slightly hairy; pollen oblong, 3-ribbed. Style glabrous.—*Lindau in Engl. Pfl. Ost-Afr. C.* 370.

Nile Land. British East Africa: Ribe, near Mombasa, *Wakefield*! Nyika country near Mombasa, *Wakefield*!

Mozamb. Dist. German East Africa: Usambara; Magila, *Kirk*! Tanga, *Heinsen*, 136! Duga, 300 ft., *Holst*, 3215!

6. **C. spinosa**, *Beck in Paulitschke, Harar*, 459, *figs.* 13, 14. White-hairy. Stems 1–3 in. long. Leaves 1 by $\frac{1}{3}$ in., oblong-elliptic, obtuse, narrowed into a petiole $\frac{1}{3}$ in. long, densely and shortly hairy. Spikes 1 by $\frac{3}{4}$ in., with many long white hairs; bract $\frac{2}{3}$ in. long, herbaceous, ovate-lanceolate, hairy, spine-tipped, margin not toothed; bracteoles linear, longer than the calyx. Posticous calyx-segment $\frac{1}{3}$ in. long, elliptic, 2-nerved, tip of 2 spinous hairy teeth. Corolla yellow; tube

$\frac{1}{2}$ in. long; lobes $\frac{1}{4}$ in. long or rather more. Anthers hairy; pollen long-oblong. Style glabrous.—*C. parvifolia*, Lindau in Engl. Jahrb. xx. 37, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319.

Nile Land. Somaliland: Harar, *Paulitschke*; Maid, 5000–6000 ft., *Hildebrandt*, 1404! and without precise locality, *Mrs. Lort-Phillips*.

7. **C. nilotica**, *Oliv. in Trans. Linn. Soc.* xxix. 128, t. 85. Pubescent, 1–2 ft. high. Basal leaves 0 or small; branch-leaves up to 4 by $1\frac{1}{2}$ in., elliptic, much narrowed at both ends, tip obtuse, base decurrent; petiole up to $\frac{1}{2}$ –1 in. long. Peduncles 0–4 in. long; spikes $1-2\frac{1}{2}$ by $\frac{3}{4}$ –1 in., rather dense; bract $\frac{1}{2}$ – $\frac{2}{3}$ in. long, obovate-elliptic, herbaceous, softly hairy, margin entire, tip triangular-pointed and not spinescent; bracteoles linear, $\frac{1}{2}$ in. long. Posticous calyx-segment $\frac{1}{3}$ – $\frac{1}{2}$ in. long, elliptic-lanceolate, tip very narrow and with 2 hairy teeth. Corolla-tube $\frac{2}{3}$ – $\frac{3}{4}$ in. long, linear; lobes $\frac{1}{2}$ in. long, obovate, brick-red or orange. Anthers hairy; pollen long-oblong, very square-headed, 3-ribbed. Style glabrous. Capsule $\frac{1}{3}$ in. long, narrowly elliptic, acute, 4-seeded.—*Oliv. in James, Unknown Horn Afr.* 321; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319, in Engl. Pfl. Ost-Afr. C. 370, at least partly. *C. infundibuliformis*, *Franch. Sert. Somal.* 50 (var. *brachystachys*); *Rendle in Journ. Bot.* 1896, 398; not of *Salisb.* *C. brachystachys*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319. *Crossandra* sp., *T. Thoms. in Speke, Nile Append.* 643.

Nile Land. British East Africa: Madi, *Speke & Grant*, 685! Leikipia, 6000–8000 ft., *Thomson*! Lake Rudolph, *Donaldson Smith*! Duruma, *Hildebrandt*, 2315!

Mozamb. Dist. Kavala Islands in Lake Tanganyika, *Carson*, 34! German East Africa: Usinja; Usui, *Speke & Grant*, 135! Usambara: Masheua, *Holst*, 8815! Duga, *Holst*, 3202A! Portuguese East Africa: Kerimba Islands, *Peters*! British Central Africa: Lake Moero, at Kalangwizi River, *Carson*, 14!

Var. *acuminata*, Lindau in Engl. Pfl. Ost-Afr. C. 370 (at least partly). Tip of bracts more acute or microscopically mucronate.—Lindau in Ann. Istit. Bot. Roma vi. (1896) 76. *Barleria rhyncocarpa*, *Klotzsch in Peters, Reise Mossamb.* 204; Lindau in Engl. Pfl. Ost-Afr. C. 368.

Nile Land. Eritrea: Mogod Valley, 4500 ft., *Schweinfurth & Riva*, 1567! Donkollo, near Ginda, 3000 ft., *Schweinfurth*, 303! Abyssinia: Wadi Woina, *Rohlf & Stecker*! and without precise locality, *Salt*! *Steudner*, 1513! Somaliland: Maid, 5000 ft., *Hildebrandt*, 858! 1400! Adda-Galla, *James & Thrupp*! Golis Range, *Mrs. Lort-Phillips*! *Miss Edith Cole*! and without precise locality, *Keller*, 197!

The above cited synonymy is imperfect. The typical *Crossandra nilotica* of Oliver is known in Berlin as *C. brachystachys*, Lindau.

8. **C. leikipiensis**, *Schweinf. in Höhnel, Zum Rudolph-See u. Stephanie-See, Sonderabdr.* 7. Branchlets woody, covered (as are the leaves) with minute grey simple hairs. Leaves $1\frac{1}{2}$ by $\frac{1}{2}$ in., narrowed at both ends, hardly acute, sessile, margin undulate and sometimes obscurely toothed. Peduncles 2–3 in. long; spikes 1 by $\frac{1}{3}$ in., rather

lax, with many long white silky hairs. Bracts $\frac{1}{3}$ by $\frac{1}{8}$ – $\frac{1}{6}$ in., elliptic, with a long innocuous point, silky white-hairy; bracteoles $\frac{1}{3}$ in. long, linear. Calyx $\frac{1}{4}$ in. long, of 5 distinct sepals, all silky white-hairy at the tips; posticous 2-nerved, shortly 2-toothed. Corolla $\frac{3}{4}$ in. long; lips rather large. Stamens and pollen of the genus; filaments glabrous. Pistil glabrous.—Engl. Hochgebirgsfl. Trop. Afr. 391; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 319, and in Engl. Pfl. Ost-Afr. C. 370.

Nile Land. British East Africa: Leikipia, 6000 ft., *Höhnel*, 75!

9. **C. mucronata**, *Lindau in Engl. Jahrb.* xx. 35. Very sparingly pubescent. Branches up to 10 in. long. Leaves up to 4 by $1\frac{1}{2}$ in., tapering at both ends; petiole 0 – $\frac{3}{4}$ in. long. Peduncles up to $2\frac{1}{2}$ in. long; spikes 1 – $4\frac{1}{2}$ by $\frac{3}{4}$ in.; bract $\frac{2}{3}$ in. long, elliptic, entire, thinly hairy towards the margin, tip triangular and sometimes mucronate; bracteoles $\frac{1}{3}$ in. long, linear. Posticous calyx-segment $\frac{1}{4}$ – $\frac{1}{3}$ in. long, ovate, acute, 2-nerved, tip 2-toothed. Corolla as of *C. nilotica*, but rather smaller. Anthers hairy; pollen oblong, square-headed, 3-ribbed. Style nearly glabrous.—Lindau in Engl. Pfl. Ost-Afr. C. 370; Rendle in Journ. Bot. 1896, 398.

Nile Land. Somaliland: Sheik Husein, *Donaldson Smith*. British East Africa: east side of Lake Albert Edward, *Scott-Elliott*, 8091! Lake Victoria Nyanza, at Berkeley Bay, *Scott-Elliott*, 7105!

Mozamb. Dist. German East Africa: Usambara; Nyika country, *Holst*, 571!

10. **C. subacaulis**, *C. B. Clarke*. Stem hardly any. Leaves crowded, basal, up to 6 by 2 in., narrowly obovate, obtuse; petiole hardly any. Peduncles 0–5 in. long; spikes up to 4 in. long, usually much looser than in *C. nilotica*; bracts with 5–9 prominent subparallel nerves, almost plicate; otherwise as *C. nilotica*.—*C. nilotica*, var. *acuminata*, S. Moore ex Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 345; Lindau in Engl. Pfl. Ost-Afr. 370 partly.

Nile Land. British East Africa: Jur, *Schweinfurth*, 1720! Bongo, *Schweinfurth*, 1447! 2213! Moru; village of Wary Mary, *Petherick*! Upper Nile, *Freeman & Lucas*, 76! Ukamba, *Scott-Elliott*, 6464! *Hildebrandt*, 2716! Sabaki River, *Gregory*! Nyika country, *Gregory*! Lanjora, 2000 ft., *Johnston*!

Mozamb. Dist. German East Africa: *Fischer*, 253! 481! Kilimanjaro, 2000–5000 ft., *Volkens*, 1669! 2130! *Johnston*! *Smith*! Portuguese East Africa: Boror, *Peters*!

11. **C. primuloides**, *Lindau in Engl. Jahrb.* xx. 36. Innovations pubescent. Leaves 4 by 2 in., elliptic, tips rounded, very obtuse, base narrowed; margin obscurely undulate, crenate; upper surface with many minute round glands; petiole 0. Peduncles 3–4 in. long; spikes $1\frac{1}{2}$ by $\frac{2}{3}$ in.; bracts $\frac{1}{2}$ by $\frac{1}{5}$ in., obovate-oblong, very obtuse, softly pubescent, not plicate, nerves obscure. Calyx scarcely $\frac{1}{4}$ in. long, hairy; posticous sepal bifid at the tip. Corolla clear-red; tube $\frac{3}{5}$ in. long; segments of limb $\frac{2}{3}$ in. long.

Lower Guinea. Angola: Malange, *Mechow*, 271!

12. **C. guineensis**, *Nees in DC. Prod.* xi. 281. Young parts densely short-hairy. Stems 6 in. long, simple, with 1 terminal spike. Leaves 5 by $2\frac{1}{4}$ in., ovate, glabrescent, obtuse, margin undulate, base narrowed, suddenly contracted into the petiole; petiole $\frac{1}{8}$ – $\frac{1}{2}$ in. long, rusty-villous. Spike sessile, up to 5 by $\frac{1}{3}$ in.; bract $\frac{3}{4}$ by $\frac{1}{5}$ in., lanceolate, minutely toothed towards the top, nearly glabrous; bracteoles $\frac{1}{3}$ in. long, linear. Calyx white (*G. Mann*); posticous segment $\frac{1}{5}$ in. long, elliptic-lanceolate, 2-nerved, glabrous, margin toothed, tip with 2 points. Corolla lilac or white; tube $\frac{2}{3}$ in. long; lobes $\frac{1}{3}$ in. long, obovate. Pollen narrow-oblong, square-headed, 3-ribbed. Style glabrous, a few hairs at the apex of the ovary. Capsule $\frac{1}{2}$ in. long, broad-lanceolate, 4-seeded, glabrous, seed-bearing nearly from the base; seeds very strongly tubercled, without hairs.—*Benth. in Hook. Niger Fl.* 481; *Hook. f. Bot. Mag. t.* 6346; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 319, and in *Engl. Pfl. Ost-Afr. C.* 370.

Upper Guinea. Cameroons: Victoria, *Preuss*, 1349! *Buchholz!* Barombi, *Preuss*, 371! 499! Bipindi, *Zenker*, 1054! Lolodorf, *Staudt*, 360! Yaunde, *Zenker & Staudt*, 408! Fernando Po, 2000 ft., *Mann*, 50!

Lower Guinea. Gaboon: Munda; Sibange Farm, *Soyaux*, 396! Mfoa, *Bates*, 546! Sierra del Crystal, *Mann*, 1694!

This plant has sometimes, when wild, beautifully white-veined leaves and brown-red bracts.

13. **C. puberula**, *Klotzsch in Peters, Reise Mossamb.* 214. Young parts pubescent. Branches 6–15 in. long. Leaves up to 6 by 2 in., elliptic, glabrescent, margin entire or undulate, tip obtuse, base decurrent sometimes to the base of the petiole; petiole 0– $1\frac{1}{2}$ in. long. Peduncles lateral, 0–9 in. long; spike up to $4\frac{1}{2}$ by $\frac{3}{4}$ in.; bract $\frac{3}{4}$ in. long, lanceolate, entire, glabrescent (bracteoles and calyx-segments with a linear scabrous mucro); bracteoles $\frac{1}{2}$ in. long, oblong. Posticous calyx-segment $\frac{1}{4}$ in. long, or rather more, ovate, 2-nerved, tip 2-toothed. Corolla-tube $\frac{1}{3}$ in. long; lobes $\frac{1}{3}$ in. long. Pollen narrow-oblong, square-headed, 3-ribbed. Style very thinly hairy. Capsule $\frac{1}{3}$ by $\frac{1}{6}$ in., 4-seeded.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 319, and in *Engl. Pfl. Ost-Afr. C.* 370; *C. pubescens*, *Klotzsch in Peters, Reise Mossamb.* 213; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 319, and in *Engl. Pfl. Ost-Afr. C.* 370.

Mozamb. Dist. German East Africa: Dar-es-Salaam, *Kirk!* Portuguese East Africa: Lower valley of the River Shire, *Meller!* Morambala Mountain, *Waller!* Lower Zambesi, at Boror, *Peters!* British Central Africa: Nyasaland; Mount Malosa, 4000–6000 ft., *Whyte!* Manganja Hills, *Kirk!* River Shire, *Kirk!* and without precise locality, *Buchanan*, 860!

Var. ? *Smithii*, *C. B. Clarke*. Stem and leaves nearly glabrous. Leaves hardly exceeding 1 in. in length. Peduncles long; heads $1\frac{1}{4}$ by $\frac{3}{4}$ in., laxly few-flowered. Bracts $\frac{3}{4}$ by $\frac{1}{4}$ in., upper part triangular-lanceolate, obtuse or apiculate, texture herbaceous, 3–5-ribbed with few long hairs.

Nile Land. East Tropical Africa, *Donaldson Smith!* British East Africa: Leikipia, *Gregory!*

*Imperfectly known species.*14. **C. parviflora**, Schweinf. & Volk. *Liste Pl. Somal.* 17.

Nile Land. Somaliland: Salul torrent, *Ghika*.

This species is not described, but is said to be *C. parviflora*, Lindau, l.c. This should mean, Lindau in *Ann. Istit. Bot. Roma* vi. (1896) 72; but the species *C. parviflora* has not been found in that volume nor anywhere else.

29. **CRABBEA**, Harvey partly; Benth. et Hook. f. *Gen. Pl.* ii. 1092.

Calyx-segments 5, acute, more or less unequal. Corolla $\frac{1}{3}$ – $\frac{3}{4}$ in. long; lobes 5, subequal, in 2 lips; anticous 3-lobed lip folded down over the other in bud. Stamens 4, subsimilar; filaments subglabrous; anthers of 2 mucous oblong cells, one a little lower, sometimes one cell smaller or hardly any; pollen globose, reticulate. Ovary glabrous; ovules 4–2 in each cell; style glabrous, articulated on the ovary; one stigma a rhomboid short plate, the other nearly wanting. Capsule small, narrow-oblong, 8–4-seeded; seeds discoid, covered with fine simple hygroscopic hairs.—Low shrubs; hairs simple, tawny. Inflorescence in dense axillary or peduncled heads; unilateral racemes (or scorpioid cymes) twisted and rolled up; bracts large, one fertile, one sterile, ovate or oblong, falcate, usually spine-toothed; bracteoles 0.

Species 6, in Tropical and South Africa.

This genus has been arranged next *Barleria*, solely because of the bracts and heads. The numerous ovules, the 5 separate sepals, and the globose reticulated pollen, show that its real affinity must be sought elsewhere.

Secondary nerves of leaves obscure; cystoliths conspicuous.

Heads sessile; posticous sepal linear.

Leaves pubescent on the nerves, otherwise scarcely

hairy 1. *nana*.

Leaves hairy on both faces, specially the lower 2. *hirsuta*.

Heads peduncled; posticous sepal elliptic-acuminate 3. *velutina*.

Secondary nerves of leaves conspicuous on the lower face 4. *reticulata*.

1. **C. nana**, Nees in *DC. Prod.* xi. 162. Root woody; branches 2–9 in. long, flexuous, fuscous, hairy. Leaves 4 by $1\frac{1}{4}$ in., oblong-elliptic, when mature scabrid hairy on the nerves beneath, otherwise glabrescent, cystoliths prominent on the upper face, tip rounded, margin hardly wavy-crenate, base narrowed; petiole $0\frac{1}{6}$ in. long. Heads axillary, 1–2 in. in diam.; outer floral leaves $1\frac{1}{3}$ by $\frac{1}{2}$ in., acute, glabrescent, shining, spinous teeth $\frac{1}{4}$ in. long; fertile bract $\frac{2}{3}$ in. long, oblong, falcate. Calyx $\frac{2}{3}$ in. long, of 5 pale hairy linear subequal sepals. Corolla $\frac{3}{4}$ in. long. Capsule $\frac{1}{2}$ in. long.—T. Anders. in *Journ. Linn. Soc.* vii. 32; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 313. *C. cirsioides*, Nees in *DC. Prod.* xi. 163. *C. ovalifolia*, Ficalho & Hiern in *Trans. Linn. Soc.* ser. 2, Bot. ii. 24, t. 6, fig. A. *Ruellia nana* and *R. cirsioides*, Nees in *Linnæa*, xv. 354, 355.

Mozamb. Dist. British Central Africa: Nyasaland; Manganja Hills, *Kirk!* Zambesi head-waters, *Serpa Pinto*.

Also in South Africa.

2. **C. hirsuta**, *Harvey in Hook. London Journ. Bot.* i. (1842) 27. Mature leaves hairy on the lower surface. Heads sessile or nearly so; outermost floral-leaves hairy. Posticous sepal $\frac{3}{5}$ by $\frac{1}{8}$ in.; anticous each $\frac{2}{5}$ by $\frac{1}{12}$ in.; inner two $\frac{1}{3}$ by $\frac{1}{18}$ in.—Nees in DC. Prod. xi. 163; T. Anders. in Journ. Linn. Soc. vii. 32; Lindau in Engl. Jahrb. xvii. 63, t. 1, fig. 28, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 313, and var. *somalensis* in Ann. Istit. Bot. Roma vi. (1896) 71.

Nile Land. Somaliland: Burgi, *Riva*, 1347!

This species differs very little from *C. nana*. The Somali specimen is said by Lindau to differ from the Cape type by having the "bracts less acuminate, more glabrate"; but I see no "varietal" difference even.

3. **C. velutina**, *S. Moore in Journ. Bot.* 1894, 135. Branches 2-6 in. long, hairy. Leaves up to 9 by 2 in., oblong-elliptic, hairs on the upper surface scattered, on the lower chiefly along the nerves, cystoliths obscure above but conspicuous beneath, tip subobtuse, margin minutely crenulate, base long tapering; petiole $\frac{1}{8}$ -1 in. long. Heads 1-1 $\frac{1}{2}$ in. in diam.; peduncles $\frac{1}{4}$ -1 $\frac{1}{2}$ in. long; outer floral-leaves 1 in. long, shining, glabrescent, with marginal teeth $\frac{1}{4}$ - $\frac{1}{2}$ in. long. Calyx $\frac{1}{2}$ in. long; posticous sepal elliptic-lanceolate, more than twice as broad as the others. Corolla white (*Lugard*). Capsule $\frac{1}{3}$ in. long, slender; otherwise nearly as *C. nana*.—Lindau in Engl. Pfl. Ost-Afr. C. 368.

Nile Land. British East Africa: Mombasa, *Taylor*!

Mozamb. Dist. Portuguese East Africa: Shamo, near the mouth of the River Shire, *Kirk*! Lower Zambesi; Lupata, *Kirk*! British Central Africa: Nyasaland. *Buchanan*, 906! Ngamiland; Kwebe, *Lugard*, 131!

4. **C. reticulata**, *C. B. Clarke*. Leaves up to 4 by 1 in., narrow oblong-elliptic, hairy on both surfaces, cystoliths obscure, secondary veins prominent on the lower face, margin minutely crenulate, tip subobtuse, base long attenuate; petiole 0- $\frac{1}{2}$ in. long. Heads $\frac{3}{4}$ -1 $\frac{1}{4}$ in. in diam.; peduncles $\frac{1}{4}$ -1 $\frac{1}{2}$ in. long; outer floral-leaves up to 1 in. long, pubescent, marginal spines $\frac{1}{8}$ - $\frac{1}{6}$ in. long. Calyx scarcely $\frac{1}{2}$ in. long; posticous sepal lanceolate, nearly twice as wide as the others. Corolla $\frac{2}{3}$ in. long, white.

Nile Land. British East Africa: Ukamba, 4000 ft., *Scott-Elliot*, 2309!

Mozamb. Dist. German East Africa: Karagwe, 4000-5000 ft., *Scott-Elliot*, 8147!

30. THOMANDERSIA, Baill. Hist. Pl. x. 456.

Calyx-tube $\frac{1}{8}$ - $\frac{1}{6}$ in. long, wide-cylindric; lobes 5, subequal, ovate. Corolla $\frac{3}{4}$ in. long; tube $\frac{1}{2}$ in. long, 2-lipped; anticous 3-lobed lip longer, folded down over the other in the bud. Stamens 4, subsimilar; anthers of 2 muticous oblong cells at equal height; pollen subglobose, smooth, with 6 slender longitudinal depressions. Ovary and style glabrous; stigma of 2 short unequal branches; ovules 2 in each cell, superposed. Capsule globose-ellipsoid, compressed, very woody, 2-seeded, sometimes

obovoid, 4-seeded (? perfectly).—Shrub. Leaves entire. Inflorescence in very long narrow thin axillary racemes; bract minute; bracteoles 0.—*Scytanthus*, Benth. in Benth. et Hook. f. Gen. Pl. ii. 1093.

Species 1, endemic.

1. **T. laurifolia**, *Baill. Hist. Pl. x. 456*. Shrub, 8–15 ft. high; young parts and inflorescence densely and minutely pubescent. Leaves up to 7 by 3 in. (usually half this size), elliptic or obovate, shortly acuminate, obtuse, when mature glabrous, shining; petiole $\frac{1}{4}$ –1 in. long. Racemes 9 by $\frac{3}{4}$ in., many- (often 50-) flowered; pedicels $\frac{1}{20}$ – $\frac{1}{8}$ in. long; bracts $\frac{1}{16}$ in. long, lanceolate. Corolla pubescent without, white or with red-purple marks.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 8 B. 325, fig. 111, L. *a, b* (not correct). *Scytanthus laurifolius*, T. Anders. ex Benth. in Benth. & Hook. f. Gen. Pl. ii. 1093, and in Hook. Ic. Pl. t. 1209; Büttner in Verh. Ver. Brandenb. xxxii. (1891) 43.

Upper Guinea. Old Calabar River, *Mann*, 2321! *Kalbreyer*, 204! Cameroons: Bipinde, *Zenker*, 989! Batanga, *Bates*, 324! Lolodorf, *Staudt*, 417! 553! Barombi, *Preuss*, 13! 339! Cameroon River, *Mann*, 718! 2207!

Lower Guinea. Gaboon: Munda; Sibange Farm, *Soyaux*, 227! 372! Gaboon River, *Mann*! and without precise locality, *Büttner*, 352! 451!

South Central. Congo Free State; Bangala, on the Congo, 900–1000 ft., *Hens*, 113!

The figure of the pollen by Lindau above cited, showing it to be a thin disc, is (it is submitted) erroneous.

31. **LEPIDAGATHIS**, Willd.; Benth. et Hook. f. Gen. Pl. ii. 1101.

Sepals 5, nearly or quite distinct (in *L. calycina*, 2 anticous united less than $\frac{1}{4}$ the way up); posticous sepal usually much wider, often longer, often pointed or subspinescent. Corolla $\frac{3}{4}$ –1 in. in total length, conspicuously 2-lipped; tube inflated in the upper part, often with dense strong deflexed hairs at the top of the cylindric portion; posticous lip ovate-oblong, emarginate, inside in the bud. Stamens 4; anther-cells on posticous stamens 2 in typical part of genus (except by accident, though often narrower than the anthers of the anticous stamens); in sect. *Neuracanthopsis* the anthers of posticous stamens are 1-celled; anthers oblong, often acute (or with mucro) at the base, one inserted lower than the other; pollen ellipsoid, or short ellipsoid, with 3 narrow longitudinal depressions and pores, surface reticulated very shallowly, or in places merely granulated. Ovary with 2–1 ovules in each cell, often slightly hairy at the top; style long, glabrous or with scattered hairs in the lower part; stigma short, oblong or elliptic. Capsule $\frac{1}{3}$ in. long or less, ovoid, 2-seeded, or narrow ellipsoid and 4-seeded. Seeds densely hairy all over; hairs tufted, sometimes spirally marked within or single, more or less hygroscopic.—Under-shrubs. Leaves entire in the African species. Inflorescences hairy, often densely so, not infrequently more or less spinescent, densely compounded of small scorpioid cymes, capitate or subcylindric; bract elliptic or oblong; bracteoles 0.

Species 80, in the hotter parts of the world, whereof only 8 in America.

This genus is by Bentham (Gen. Pl. ii. 1068), by Lindau (Engl. & Prantl, l.c. 312), and by other authors, specially diagnosed by having all the anthers 2-celled, by which it is distinguished from *Neuracanthus* and other closely allied genera. I find the posticous stamens throughout the sect. *Neuracanthopsis* (the species of which are placed in *Lepidagathis* by Bentham and Lindau) to have 1-celled anthers. *Lepidagathis* is nevertheless well separated naturally from *Neuracanthus* by its 2-lipped corolla, and is easily separated in dried specimens by its 5-sepalous calyx.

* EU-LEPIDAGATHIS.—Posticous stamens with 2-celled anthers.

Inflorescence terminal.

Leaves elliptic-lanceolate or ovate-lanceolate 1. *L. scariosa*.

Leaves narrowly linear 2. *L. angustifolia*.

Inflorescence of dense heads near the crown of the root; the elongated leafy branches without flowers, or rarely with a small axillary head.

Leaves hairy above and on the nerves beneath, 2 by $\frac{1}{3}$ in. 3. *L. radicalis*.

Leaves when mature very slightly hairy.

Leaves 4 by $\frac{1}{4}$ – $\frac{1}{3}$ in. 4. *L. Schweinfurthii*.

Leaves $1\frac{1}{4}$ by $\frac{1}{3}$ in., shining, rather wider above the middle 5. *L. ampliata*.

Leaves glabrous, at least when mature.

Leaves 2 by $\frac{1}{6}$ in. 6. *L. Fischeri*.

Leaves 7 by $\frac{1}{5}$ in. 7. *L. anobrya*.

Inflorescence of several axillary heads towards the middle or upper part of the stems. (Inflorescences near the base have been seen in one example of *L. myrtifolia* and in one example of *L. mollis*.)

Inflorescence in short globose or ovoid heads.

Mature leaves glabrate (in *L. lanatoglabra* the uppermost leaves very hairy: see *L. lanatoglabra*, var.).

Leaves 1 by $\frac{1}{2}$ in.; branches flexuous 8. *L. myrtifolia*.

Leaves linear.

Sepals without a fringe of white hairs on the shoulders.

Leaves hardly 2 in. long.

Sepals $\frac{1}{2}$ in. long, softly white-hairy at the tip 9. *L. sparsiceps*.

Sepals $\frac{1}{2}$ in. long, bristle-tipped 10. *L. lanatoglabra*.

Sepals 1 in. long. 11. *L. longisepala*.

Leaves 3 in. long; inflorescence nearly glabrous 12. *L. perglabra*.

Sepals with a fringe of white hairs on the shoulders 13. *L. fimbriata*.

Mature leaves hairy at least beneath.

Heads scattered often in the lower part of the stems 14. *L. mollis*.

Heads in opposite axils 15. *L. diversa*.

Heads scattered, mostly in the upper axils, shaggy white 16. *L. andersoniana*.

Inflorescence of oblong erect dense one-sided spikes.

Floral leaves with recurved tails; sepals not tailed 17. *L. heudelotiana*.

- Floral leaves without (or with very short erect)
 tails 18. *L. peniculifera*.
 Floral leaves and sepals with long recurved tails . 19. *L. Medusæ*.

**NEURACANTHOPSIS. — Posticous stamens with usually 1-celled anthers. (Slender plants; floral leaves not uniseriate except somewhat in *L. pallescens*.)

Heads strobilate; floral leaves imbricate.

- Leaves narrow-oblong; floral leaves somewhat
 1-seriate 20. *L. pallescens*.
 Leaves elliptic; floral leaves imbricate on all
 sides 21. *L. calycina*.

Heads with narrower floral leaves, not strobilate.

Leaves often 2 in. or more.

Sepals with minute hairs, many gland-tipped.

- Spikes axillary and terminal 22. *L. glandulosa*.

- Spikes all terminal 23. *L. laguroidea*.

Sepals with spreading white hairs, none gland-tipped 25. *L. scabra*.

- Leaves at most 1 by $\frac{1}{4}$ in. 24. *L. hyssopifolia*.

1. ***L. scariosa***, Nees in Wall. *Pl. As. Rar.* iii. 95. Young parts stellate-hairy. Leaves 2 by $\frac{2}{3}$ in., elliptic or subovate, narrowed at either end, when mature minutely hairy above, grey tomentose beneath, feather-nerved, primary nerves raised on the under surface; petiole $0-\frac{1}{10}$ in. long. Heads terminal, ovoid, up to $1-1\frac{1}{2}$ in. in diam., innocuously prickly. Posticous sepal $\frac{1}{3}-\frac{1}{2}$ by $\frac{1}{10}-\frac{1}{8}$ in., with many soft white and some gland-tipped hairs. Corolla $\frac{2}{3}-1$ in. in total length. Posticous stamens with the anthers 2-celled but much narrower than those of the anticous stamens. Ovary hairy at the top. Capsule $\frac{1}{3}$ in. long, 4-seeded.—Nees in DC. *Prod.* xi. 251; Wight, *Ic.* t. 457; C. B. Clarke in Hook. f. *Fl. Brit. Ind.* iv. 520; Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 313, in Engl. *Pfl. Ost-Afr.* C. 368, and in *Ann. Istit. Bot. Roma* vi. (1896) 70. *L. terminalis*, Nees in DC. *Prod.* xi. 251; A. Rich. *Tent. Fl. Abyss.* ii. 146; T. Anders. in *Journ. Linn. Soc.* vii. 33; Zarb, *Cat. Spéc. Bot. Pfund*, 32. *Volkensiophyton neuracanthoides*, Lindau in Engl. *Jahrb.* xx. 27, and in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 315, and in Engl. *Pfl. Ost-Afr.* C. 369.

Nile Land. Kordofan, *Pfund*, 307! 402! 428! Upper Senaar: Fazokl, *Kotschy*, 482! Eritrea: Ginda, 3000 ft., *Schweinfurth & Riva*, 2140! Abyssinia: below Sessaquilla, *Schimper*, 815! Togodele, *Steudner*, 1862! and without precise locality, *Schimper*, 692! 1920! Somaliland: Ahl Mountains, 5000–6000 ft., *Hildebrandt*, 856! Ogaden, *Riva*, 290! 797! British East Africa: Taita; Ndara Mountain, 2000 ft., *Hildebrandt*, 2459!

Mozamb. Dist. German East Africa: Kilimanjaro; Lake Chala, *Volkens*, 318!

In *Volkens*, 318, type of *Volkensiophyton*, Lindau, I find the calyx of 5 segments (not 4 as given by Lindau) and the 2 posticous anthers 2-celled (not 1-celled as given by Lindau). The pollen is said in *Lepidagathis* to be honeycombed (which is not said of the pollen of *Volkensiophyton*); but the pollen is really the same; the reticulation of the extine in *Lepidagathis* is exceedingly shallow, and in places broken up and passing over into mere granulation.

2. **L. angustifolia**, *C. B. Clarke*. Stellately tawny tomentose. Branches woody, very slender. Leaves $1\frac{1}{2}$ –2 by $\frac{1}{8}$ in. Inflorescence terminal, 1 by $\frac{1}{2}$ in., ovoid-oblong, softly hairy, not spinous. Sepals 5; posticous $\frac{1}{3}$ by $\frac{1}{2}$ in., softly hairy. Corolla $\frac{2}{3}$ by $\frac{3}{4}$ in., altogether as of *Lepidagathis*. Posticous stamens with 2-celled anthers (narrower than those of the anticous stamens). Ovules and pollen of the genus.

Lower Guinea. Angola: Cunene River, *Johnston!*

3. **L. radicalis**, *Nees in DC. Prod. xi. 255*. Branches pubescent. Leaves up to 2 by $\frac{1}{3}$ in., sessile, subobtuse at both ends, hardly 3-nerved; primary lateral nerves raised beneath, prominent, hairy; upper surface hairy and with transverse cystoliths. Inflorescence radical up to 2–3 in. in diam., of several softly hairy heads. Posticous sepal nearly $\frac{2}{3}$ by $\frac{1}{8}$ in., broadly lanceolate, softly white-hairy. Corolla $\frac{1}{2}$ – $\frac{2}{3}$ in. long, appearing when dried yellow with purple palatal spots (as is common in the genus). Posticous stamens with 2 anthers; pollen rather long, ellipsoidal, very imperfectly reticulated. Ovary hairy in the upper half.—*A. Rich. Tent. Fl. Abyss. ii. 148*; *T. Anders. in Journ. Linn. Soc. vii. 33*; *Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 244*; *Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 313*, and in *Engl. Pfl. Ost-Afr. C. 368*. *Russegera collina*, *Endl. Iconogr. t. 94*.

Nile Land. Eritrea: Hamasen, *Steudner, 1528!* Abyssinia: near Adowa, *Schimper, 1072!* near Axum, *Schimper, 1525!* Wodjerat, *Petit!*

Steudner, 1528, agrees closely with *Schimper's* collections, and is the plant above described. The *Wodjerat* plant has narrower, more glabrous leaves, approaching much *L. Fischeri* at first aspect, but the leaves are not 3-nerved.

4. **L. Schweinfurthii**, *Lindau in Engl. Jahrb. xx. 16*. Leaves up to $4\frac{1}{4}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., sparingly hairy, sub-3-nerved; marginal nerve continuous nearly to the tip; primary lateral nerves slender. Pollen short-ellipsoid; otherwise as *L. radicalis*.—*Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 313*.

Nile Land. British East Africa: Jur; Jur Ghattas, *Schweinfurth, 2339!*

5. **L. ampliata**, *C. B. Clarke*. Leaves $1\frac{1}{4}$ by $\frac{1}{3}$ in., very slightly hairy, not 3-nerved, widened above the middle, lower elongate-obovate; otherwise as *L. scariosa*.

Nile Land. British East Africa: Kavirondo, *Scott-Elliot, 7072!*

This plant is very near the two preceding. It hardly differs from some examples of *L. hamiltoniana*, *Wall.* (from British India), except in that the leaves are more shining.

6. **L. Fischeri**, *C. B. Clarke*. Sterile branches long, slender, glabrous. Leaves 2 by $\frac{1}{8}$ in., glabrous, 3-nerved. Inflorescences 2–3 in. in diam., dense, of many heads, near the top of the creeping stem (it creeps 4 in. with nodes only $\frac{1}{8}$ in. apart). Posticous sepal $\frac{1}{2}$ in. long, woolly, straight in fruit. Otherwise as *L. radicalis*.

Mozamb. Dist. German East Africa: Unyamwezi; Usuri, *Fischer, 490!*

7. **L. anobrya**, *Nees in DC. Prod.* xi. 255. Leaves up to 7 by $\frac{1}{5}$ in., glabrate, 3-nerved. Inflorescence of several radical heads (one head seen in an axil $\frac{1}{3}$ way up a branch), prickly; bract $\frac{1}{4}$ – $\frac{1}{3}$ in., narrow-lanceolate, sparsely hairy. Sepals 5, with soft white hair or nearly glabrate; posticous sepal $\frac{1}{2}$ in. or more long, elliptic, suddenly narrowed into a straight linear point; two anticous sepals with lamina $\frac{1}{4}$ in. broad-ovate, suddenly narrowed into a falcate subreflexed linear point. Capsule scarcely $\frac{1}{4}$ in. long, 2-seeded.—Benth. in Hook. Niger Fl. 480; T. Anders. in Journ. Linn. Soc. vii. 33.

Upper Guinea. Senegambia, *Heudelot*, 204!

8. **L. myrtifolia**, *S. Moore in Journ. Bot.* 1880, 38. Stems 2–3 ft. high, flexuous, creeping, slender, pubescent (apparently applied to a rock or tree, rooting, and flowering chiefly in the axils immediately above the attachment). Leaves 1 by $\frac{1}{2}$ in., elliptic, triangular-pointed apiculate, nearly sessile, when mature nearly glabrous shining, not 3-nerved; cystoliths obscure. Inflorescences radical and scattered, of dense small ovoid heads $\frac{2}{3}$ in. in diam., softly white-hairy, hardly prickly; bract $\frac{1}{3}$ in. long, lanceolate, acuminate, white-hairy. Sepals 5, $\frac{1}{2}$ – $\frac{2}{3}$ in. long, acuminate, acute, softly white-hairy, and with some gland-tipped hairs; posticous sepal $\frac{1}{2}$ – $\frac{1}{8}$ in. broad, oblong-lanceolate. Corolla $\frac{2}{3}$ in. long. Pollen ellipsoid with 3 longitudinal depressions and 3 pores; the intermediate surface granular, scarcely obsolete reticulate. Ovule 1 in each cell, fide *S. Moore*.

Nile Land. British East Africa: Jur; Gir, *Schweinfurth*, 2493!

Bentham observes (in Benth. & Hook. f. Gen. Pl. ii. 1101) that, though in one plant of this genus the cells of the ovary are 1-ovulate, he found a minute rudimentary second ovule. This occurs frequently in *Barleria*. In these genera, which have 4-seeded and 2-seeded species, little weight can be attached to the character "ovary-cells 2-ovulate, or 1-ovulate, or 1-ovulate with a more or less rudimentary lower ovule added."

9. **L. sparsiceps**, *C. B. Clarke*. Branches and mature leaves nearly glabrous. Leaves $2\frac{1}{4}$ by $\frac{1}{10}$ – $\frac{1}{5}$ in., 3-nerved, with transverse cystoliths on the upper surface. Heads up to $\frac{3}{4}$ in. long and broad, obconoid, 1 (more rarely 2–3) axillary, scattered nearly the whole length of the branches (no basal heads seen). Calyx and corolla nearly as of *L. radicalis*, linear tips of the sepals rather longer with very much soft white hair. Pollen ellipsoidal, with 3 longitudinal depressions and pores, scarcely reticulated.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, 2000–3000 ft., *Whyte!* Nyika Plateau, 6000–7000 ft., *Whyte!* Manganja Hills, 2000 ft., *Kirk!*

This plant, in its glabrous linear 3-nerved leaves, is very near *L. Schweinfurthii*; the scattered more hairy white heads differ.

10. **L. lanatoglabra**, *C. B. Clarke*. Tips of barren branches and uppermost leaves white-woolly, other leaves nearly glabrous. Leaves $2\frac{1}{4}$ by $\frac{1}{10}$ – $\frac{1}{5}$ in., 3-nerved, with transverse cystoliths on the upper

surface; leaves $\frac{1}{3}$ in. wide occur in some examples, and the uppermost woolly leaves are always wider, sometimes elliptic-lanceolate. Heads many, axillary, scattered throughout the middle of the branches, up to $\frac{3}{4}$ in. long and broad, obconoid. Sepals 5, $\frac{1}{2}$ in. long, ending in bristles $\frac{1}{10}$ in. long and upwards, without long white hairs; otherwise as *L. sparsiceps*.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, 2000–3000 ft., *Whyte!* North Nyasa, 1700–2000 ft., *Whyte!* Kondowe to Karonga, 2000–6000 ft., *Whyte!*

Var. *latifolia*, C. B. Clarke. Stems hairy to the base. Leaves all hairy, broader, up to $1\frac{1}{2}$ by $\frac{2}{3}$ in., subsessile, rounded at the base, 3-nerved or some 5-nerved.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau at Fort Hill, 3500–4000 ft., *Whyte!*

11. **L. longisepala**, C. B. Clarke. Branches and mature leaves nearly glabrous. Leaves $2\frac{1}{4}$ by $\frac{1}{4}$ in., 3-nerved to the tip, with transverse cystoliths on the upper surface. Head 2 in. in diam., globose, in an upper axil. Calyx 1 in. long; posticous sepal having a lamina $\frac{1}{2}$ by $\frac{1}{8}$ in. with a linear woolly hairy point $\frac{1}{2}$ in. long. Corolla hardly $\frac{3}{4}$ in. long. Stamens 4; (in all 4) cells of anthers 2, oblong, muticous, parallel, one slightly lower, with a row of papillæ fringing the slit (as usual in *Eu-Lepidagathis*); pollen small, tetrahedral, smooth with very slender simple reticulations. Pistil glabrous, altogether as of the genus.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, 5250 ft., *Nutt!*

The pollen is remote from anything seen in *Lepidagathis*; I have examined it in 5 or 6 flowers and believe it to be abnormal, sterile. I have found one or two grains not unlike the pollen of the preceding species.

12. **L. perglabra**, C. B. Clarke. Very glabrous, margins of the floral leaves with a few white long hairs. Branch 20 in. long, divided, very straight. Leaves $3\frac{1}{4}$ by $\frac{1}{4}$ in., 3-nerved, with transverse cystoliths on the upper surface. Heads numerous, scattered, axillary in the upper part of the branches, very young.

Nile Land. Bongo: Ngoli (Nyoli), *Schweinfurth*, 4076 partly!

This is totally different from the other part of *Schweinfurth*, 4076, in Herb. Kew. (= *L. Medusæ*, S. Moore); the mixture is "noted" to have taken place before the two plants arrived at Kew. The present plant has very young heads, but is very distinct in habit.

13. **L. fimbriata**, C. B. Clarke. Branches and linear leaves nearly glabrous. Inflorescences in the upper axils subglobose, 1– $1\frac{1}{2}$ in. in diam., compound, very dense, with many numerous fine brown, scarcely hairy or prickly, slender curved points to the floral leaves. Sepals 5; posticous $\frac{1}{4}$ in. long, obovate-quadrate, tip depressed-triangular, with a dense row of white hairs below the tip; mucro $\frac{1}{8}$ in. long, fine brown, microscopically scabrous; 2 anticous sepals nearly as the posticous but smaller; 2 interior sepals slightly longer than the posticous, oblanceolate with fringed shoulders and a scabrous mucro. Capsule $\frac{1}{4}$ in. long, 4-seeded.

Upper Guinea. Senegambia, *Heudelot*, 679!

The long brown scabrous curved points of the floral leaves and the dense white fringe of long white hairs on the shoulder of the sepals make this species remarkable. It is very rare in *Lepidagathis* for the 2 innermost sepals to be as long as the others.

14. **L. mollis**, *T. Anders. in Journ. Linn. Soc.* vii. 33. Branches 2 ft. long, and mature leaves with simple hairs. Leaves 3 by $\frac{1}{4}$ in., 3-nerved, with transverse cystoliths on the upper surface. Inflorescences of basal and axillary clusters of heads; points of the floral leaves and posticous sepals erect, soft white-hairy, hardly prickly. Posticous sepal $\frac{1}{2}$ in. long, lanceolate with a long hairy linear tip. Corolla $\frac{3}{4}$ in. long, yellow with purple spots. Stamens of *Eu-Lepidagathis*. Ovary slightly hairy in the upper half.—Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 313 partly?

Upper Guinea. Niger Territory: Nupe, *Barter*, 955! Niger, *Baikie*!

15. **L. diversa**, *C. B. Clarke*. Branches stout, minutely hairy. Leaves up to 5 by $\frac{3}{4}$ in., 5-nerved. Inflorescences axillary, 2 in in diam., very dense, points of floral leaves long, numerous, pale-brown, hairy, strongly deflexed. Sepals 5, all $\frac{2}{3}$ – $\frac{3}{4}$ in. long, with falcately recurved points. Corolla nearly as of *L. mollis*.—*L. mollis*, Oliv. in *Trans. Linn. Soc.* xxix. 128; Lindau in *Engl. Pfl. Ost-Afr.* C. 368.

Nile Land. British East Africa: Madi, *Speke & Grant*, 657!

Oliver treated this as a form only of *L. mollis*; and in essentials it does not differ; nor, in essentials, do many of the species of *Eu-Lepidagathis* differ. The appearance of the present plant, owing to the falcate-recurved ("diverse") tips of floral leaves and sepals, is very different; the sepals are larger.

16. **L. andersoniana**, *Lindau in Engl. Jahrb.* xx. 16. Branches stout, shaggy. Leaves 3 by $\frac{1}{3}$ – $\frac{1}{2}$ in., 3-nerved, when mature white-villous or glabrate beneath, nearly glabrous above, with transverse cystoliths. Inflorescence of many compound dense shaggy-white heads 1–3 in. in diam., approximated in the upper axils, sometimes subterminal (then somewhat elongate with recurved points approaching *L. Medusæ*). Posticous sepal $\frac{1}{2}$ by $\frac{1}{5}$ in., elliptic-lanceolate, with a long white-hairy point. Corolla $\frac{1}{2}$ in. long. Stamens of *Eu-Lepidagathis*. Ovary with gland-tipped hairs at the top and long white hairs on the lower part of the style.—*L. Andersonii*, Lindau in *Engl. Pfl. Ost-Afr.* C. 368.

Nile Land. British East Africa: Buganda (Uganda), *Stuhlmann*, 3525!

Mozamb. Dist. German East Africa: Urundi, 4000–6000 ft., *Scott-Elliot*, 8259! British Central Africa: Nyasaland; Fort Hill, 3500–4000 ft., *Whyte*! Mount Zomba, 5000–6000 ft., *Whyte*! Shire Highlands, *Buchanan*, 76! 325! and without precise locality, *Buchanan*, 774! 832!

17. **L. heudelotiana**, *Nees in DC. Prod.* xi. 254. Branch 14 in. long, nearly glabrate. Leaves 3–4 by $\frac{1}{4}$ in., 3-nerved, hairy. Spikes compound, $1\frac{1}{4}$ by $\frac{1}{2}$ in., erect, very dense, in the upper axils; floral leaves uniseriate, ovate with linear deflexed points long white-hairy.

Sepals 5, distinct; posticous $\frac{1}{3}$ by $\frac{1}{5}$ in., ovate, obtuse, hardly mucronate. Corolla $\frac{2}{3}$ in. long. Capsule $\frac{1}{5}$ in. long, ovoid, acute, glabrous, 2-seeded or (fide *Nees*) sometimes 4-seeded.—Benth. in Hook. Niger Fl. 480; T. Anders. in Journ. Linn. Soc. vii. 33; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 313.

Upper Guinea. Senegambia, *Heudelot*, 666!

18. **L. peniculifera**, *S. Moore in Journ. Bot.* 1880, 39. Robust; branches at length glabrate. Leaves $1\frac{1}{4}$ by $\frac{1}{6}$ in., 3-nerved, tips almost spinescent, with long white simple hairs. Spikes compound, 2 by $\frac{2}{3}$ in., erect, 1-2-together, in the upper axils; floral leaves uniseriate, densely packed, leathery, ovate with short (or most of them without any) mucro. Sepals 5, distinct, leathery, obtuse, with dense thick hair; posticous $\frac{1}{3}$ by $\frac{1}{6}$ in., ovate. Corolla $\frac{2}{3}$ in. long; stamens and pollen as of *Eu-Lepidagathis*.

Nile Land. Mittu: Reggo, *Schweinfurth*, 2794!

This species is named from the spikes themselves representing a painter's brush (or a little tail), they remind me of neither. The species differs much from its neighbours in the floral leaves being without tails (or very shortly mucronate).

19. **L. Medusæ**, *S. Moore in Journ. Bot.* 1880, 39. Branches stout, villous. Leaves 4 by $\frac{1}{2}$ in., 5-nerved, when mature hairy beneath, glabrate above, with transverse cystoliths. Spikes compound, $1\frac{1}{2}$ by $\frac{1}{2}$ – $\frac{2}{3}$ in., 1-2-together, erect, in the upper axils; floral leaves uniseriate, densely packed, hairy, ovate with long deflexed white-hairy tails. Sepals 5, all with long recurved white-hairy tails; posticous $\frac{1}{4}$ in. long, ovate, with a tail $\frac{1}{3}$ in. long. Corolla $\frac{2}{3}$ in. long. Stamens and pollen of *Eu-Lepidagathis*.—*L. Caput-Medusæ*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 313.

Nile Land. Bongo: Ngoli (Nyoli), *Schweinfurth*, 4076 partly!

20. **L. pallescens**, *S. Moore in Journ. Bot.* 1880, 308. Grey-pubescent with small curved hairs. Leaves $2\frac{1}{2}$ by $\frac{1}{2}$ in., lanceolate, narrowed, obtuse at both ends, subsessile, scarcely 3-nerved, upper surface glabrate with irregularly scattered (not all transversely parallel as in preceding species) cystoliths. Spikes $\frac{3}{4}$ by $\frac{1}{2}$ in., in the upper axils, brown, minutely pubescent; floral leaves few seriate. Calyx $\frac{1}{2}$ in. long, of 5 lanceolate sepals, minutely scabrous. Anthers of anticus stamens oblong, subparallel, with minute empty mucro at the base; posticous stamens with one anther perfect, one sterile imperfect or rudimentary; pollen short ellipsoid, hardly reticulated. Ovary glabrous; style hairy near the base; stigma small, spatulate.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5084!

21. **L. calycina**, *Nees in DC. Prod.* xi. 252. Young parts minutely pubescent. Leaves up to $1\frac{3}{4}$ by $\frac{2}{3}$ in., elliptic, narrowed at both ends, when mature nearly glabrous with irregularly scattered cystoliths on the upper surface; petiole 0– $\frac{1}{8}$ in. long. Spikes up to $1\frac{1}{2}$ by 1 in., strobilate, very green, terminal (many on very short lateral branches), microscopi-

cally pubescent; floral leaves $\frac{1}{2}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., imbricated on all sides (not 1-seriate). Calyx nearly $\frac{1}{2}$ in. long, glabrous or microscopically pubescent; posticous sepal $\frac{1}{5}$ in. broad, mucronate; 2 anticous sepals $\frac{1}{10}$ in. broad, very shortly connate at the base. Corolla $\frac{1}{2}$ in. long. Anthers oblong, scarcely acute at the base; posticous stamens with one anther-cell, the other minutely indicated; pollen short ellipsoid, subtrigonus, hardly reticulated. Pistil glabrous.—A. Rich. Tent. Fl. Abyss. ii. 147; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 111; T. Anders. in Journ. Linn. Soc. vii. 34.

Nile Land. Abyssinia: Gageros, on the Tacazze River, 3500 ft., *Schimper*, 131! 2190! Modat, *Schimper*, 1044! and without precise locality, *Schimper*, 1301!

22. **L. glandulosa**, *Nees in DC. Prod.* xi. 243 (*name only*). Young parts minutely pubescent. Branches slender, divided, glabrate. Leaves 2 by $\frac{3}{4}$ in., elliptic, narrowed at both ends, when mature nearly glabrous, with irregularly scattered cystoliths on the upper surface; petiole 0– $\frac{1}{8}$ in. long. Spikes axillary and terminal, somewhat lax; floral leaves lanceolate, hardly imbricate. Calyx $\frac{1}{4}$ – $\frac{1}{3}$ in. long; sepals 5, posticous hardly $\frac{1}{12}$ in. broad, with a few hairs and stalked glands and linear innocuous tip. Corolla $\frac{1}{3}$ in. long. Anthers oblong, obtuse at the base; posticous stamens with 1 anther-cell, the other hardly indicated; pollen short-ellipsoid, with 3 longitudinal depressions, obscurely reticulated.—A. Rich. Tent. Fl. Abyss. ii. 147; T. Anders. in Journ. Linn. Soc. vii. 34. *Barleria glandulosa*, *Hochst. ex Nees in DC. Prod.* xi. 243.

Nile Land. Abyssinia: Mount Scholoda, near Adowa, *Schimper*, 44!

23. **L. laguroidea**, *T. Anders. in Journ. Linn. Soc.* vii. 34. Young parts very minutely pubescent. Leaves 2 by $\frac{1}{2}$ in., from ovate to narrow-elliptic, narrowed at both ends, subglabrous; cystoliths irregularly scattered on the upper surface; petiole 0– $\frac{1}{4}$ in. long. Spikes 2 by $\frac{1}{3}$ in., terminal, often lax or interrupted at the base, not strobilate; floral leaves lanceolate-linear, not 1-seriate. Calyx $\frac{1}{4}$ in. long; posticous sepal $\frac{1}{18}$ in. broad, pointed, with a few microscopic hairs and stalked glands. Corolla $\frac{1}{3}$ in. long. Posticous stamens with anthers 1-celled or sometimes 2-celled; pollen ellipsoid, with three longitudinal depressions, subtubercular rather than reticulate. Pistil glabrous, or with few minute hairs in the lower part.—*Teliostachya laguroidea*, *Nees in DC. Prod.* xi. 264; *Benth. in Hook. Niger Fl.* 481.

Upper Guinea. Sierra Leone: Scarcies River, *Scott-Elliot*, 4533! 4744! Kambia, 4376! and without precise locality, *Afzelius!* *Smeathmann!* *Scott-Elliot*, 3902! Gold Coast: Accra. *Vogel!* and without precise locality, *Burton & Cameron!* Togoland, *Baumann*, 503! Niger Territory: Borga; Oly River, *Barter*, 746! Cameroons: Victoria, *Preuss*, 1109! 1197!

Nile Land. Mittu: Mvolo, near the Babr el Rohl, *Schweinfurth*, 2790!

24. **L. hyssopifolia**, *T. Anders. in Journ. Linn. Soc.* vii. 34. Very slender. Leaves (at most) 1 by $\frac{1}{4}$ in. Spikes up to $\frac{3}{4}$ by $\frac{1}{4}$ in. Calyx less than $\frac{1}{5}$ in. long; posticous sepal hardly $\frac{1}{4}$ in. broad; otherwise as

L. laguroidea.—*Teliostachya hyssopifolia*, Benth. in Hook. Niger Fl. 481.

Upper Guinea. Sierra Leone, Don!

I here describe the type example of G. Don only. Among Scott-Elliot's excellent examples (referred above to *L. laguroidea*), several have been heretofore marked *L. hyssopifolia*; while Scott-Elliot, 4744, has been supposed a new intermediate species. I doubt if *L. hyssopifolia* should be considered other than a slender form of *L. laguroidea*, smaller in all its parts. The two species bear a strong superficial resemblance to *Justicia* (*Rostellularia*) *diffusa*, Willd. and its numerous subspecies or varieties.

25. **L. scabra**, C. B. Clarke. Branches with approximate nodes and spreading white hairs. Leaves up to $2\frac{1}{2}$ by $\frac{3}{4}$ in., obliquely narrow-elliptic, narrowed at both ends, feather-veined, when mature pubescent beneath, glabrate above with irregularly scattered cystoliths; petiole $0-\frac{1}{5}$ in. long. Spikes terminal, or on very short axillary branches, $\frac{3}{4}$ in. long, ovoid, lax, with some simple white hairs. Sepals 5, nearly $\frac{1}{3}$ in. long, subequal, narrowly lanceolate, acute, moderately white-hairy. Corolla $\frac{1}{3}$ in. long, as of *Lepidagathis*. Stamens: 2 anticous with 2-celled anthers; anthers oblong, subparallel with empty microscopic tails at the base; 2 posticous stamens with 1-celled anthers, the other cell indicated quite rudimentary; pollen short-ellipsoid, with 3 longitudinal depressions, obscurely reticulated. Ovary glabrous, disc cup-shaped, rather long; style with few long white hairs in the lower part; stigma short spatulate.—*Neuracanthus scaber*, Lindau in Engl. Pfl. Ost-Afr. C. 369 partly.

Lower Guinea. Angola; Welwitsch, 5104!

Mozamb. Dist. German East Africa: Kilimanjaro; Lake Chala, Volkens, 320!

This plant is certainly not *Neuracanthus scaber*, S. Moore, the calyx being in 5 separate pieces and the corolla 2-lipped (quite unlike the quasi-convolvulus corolla of *Neuracanthus*). The stamens are as those of *Neuracanthus*, but they are equally like those of *L. pallescens*.

32. LINDAUEA, Rendle in Journ. Bot. 1896, 411, t. 362.

Calyx-segments 4, reticulate-nerved, somewhat papery; posticous segment elliptic, subacute; anticous subsimilar, divided about $\frac{1}{2}$ way down into 2 lanceolate teeth; otherwise as *Lepidagathis*, sect. *Neuracanthopsis*.—Flowers scattered, subsolitary.

Species 1, endemic.

This has the calyx exactly as in many *Barlerias*, but the corolla stamens and pistil of *Lepidagathis*. The pollen is nowise different from that of *Lepidagathis myrtifolia* or *L. mollis*.

1. **L. speciosa**, Rendle in Journ. Bot. 1896, 412, t. 362. Soft hairy with simple and gland-bearing hairs. Branches $\frac{1}{4}$ in. in diam. Leaves $\frac{2}{3}$ by $\frac{1}{3}$ in., narrowly elliptic-oblong; petiole $0-\frac{1}{12}$ in. long. Flowers scattered, sessile; bract $\frac{1}{8}$ in. long, linear. Calyx $\frac{1}{2}$ in. long; 2 in-

ferior segments rather shorter, linear. Corolla purple-blue; tube $\frac{1}{2}$ in. long, much inflated in the upper half; lobes $\frac{1}{2}$ – $\frac{2}{3}$ in. long, connate in two lips; anticous lip shortly 3-lobed; posticous shorter, smaller, emarginate. Stamens 4; 2 anticous with 2-celled anthers (cells oblong, parallel, at equal height, muticous); 2 posticous with 1-celled anthers; filaments glabrous. Ovary and style glabrous; stigma of 2 subequal minute oblong lobes. Capsule $\frac{2}{3}$ in. long, oblong ellipsoid, 4-seeded; seeds (unripe) appear as of *Barleria*.—Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 308.

Nile Land. Somaliland: River Shebele, *Donaldson Smith! Keller, 185*
Burka district, *Ghika!*

33. **ASYSTASIA**, Blume; Benth. et Hook. Gen. Pl. ii. 1094.

Calyx divided to the base; segments 5, subequal, narrow, often small. Corolla-tube inflated upwards; limb 5-fid, hardly 2-lipped; anticous segment wholly outside in the bud. Stamens 4; anthers all subsimilar, 2-celled; cells oblong, nearly parallel or one a little lower, muticous or with 1 or 2 small spurs at the base; pollen ellipsoid, with 3 stopples, 9 longitudinal lines; in the typical species, long-ellipsoid, square-headed, subterete; in *A. macrophylla* (and others) shortly ellipsoid, narrowed at the poles, trigonous. Ovary with 2 ovules in each cell, hairy or glabrous; stigmas 2, subequal, short, oblong or hemispheric. Capsule 4-seeded at the top, on a long solid stalk; seeds without hairs, compressed, rugose.—Herbs or shrubs. Leaves entire. Racemes, spikes or panicles apparently terminal (except in *A. anellioides*), one-sided, lax, with minute bracts and bracteoles, or distichous with larger bracts, or densely strobiliform with large bracts and bracteoles.

Species 34, in the warmer parts of the Old World.

*Inflorescence, at least apparently, terminal.

Bracts minute; racemes often 3- to many-flowered.

Ovary hairy, at least in the upper half.

Leaves ovate to oblong.

Sepals $\frac{1}{5}$ – $\frac{1}{8}$ in. long.

Corolla-tube $\frac{3}{4}$ –1 in. long.

Pubescent or hairy 1. *A. coromandeliana*.

Glabrous except the corolla 4. *A. congensis*.

Corolla-tube $\frac{1}{3}$ in. long. 2. *A. parvula*.

Sepals $\frac{1}{2}$ in. long 3. *A. Buettneri*.

Leaves linear; corolla-tube $\frac{1}{3}$ in. long 5. *A. linearis*.

Ovary glabrous (very glandular in *A. longituba*).

Corolla-tube 1–1 $\frac{3}{4}$ in. long; leaves large.

Anthers scarcely tailed.

Inflorescence dense 6. *A. scandens*.

Inflorescence lax.

Ovary glabrous; corolla-tube 2 in. 7. *A. vogeliana*.

Ovary glandular; corolla-tube 1 $\frac{3}{4}$ in. 8. *A. longituba*.

Anther-cells each with 2 tails; leaves 8–14 in.

long 9. *A. macrophylla*.

Corolla-tube $\frac{1}{3}$ in. long 10. *A. africana*.

Bracts shorter than the calyx, ovate, hardly acute.

Sepals with short hairs; ovary glabrous 11. *A. Welwitschii*.

Sepals white-shaggy; ovary hairy at the top 12. *A. Charmian*.

Bracts exceeding the calyx; spikes almost strobilate.

Annual; leaves mostly oblong 13. *A. Schimperii*.

Woody shrub; leaves elliptic to round-ovate 14. *A. Coleæ*.

**Racemes axillary, loosely 2-1-flowered; bracts very

small 15. *A. anselioides*.

1. **A. coromandeliana**, *Nees in Wall. Pl. As. Rar.* iii. 89. Perennial, 1-4 ft. high, with simple hairs. Leaves 3 by 1 in. (sometimes 5 by $1\frac{3}{4}$ in.), ovate, suddenly narrowed at the base; petiole $\frac{1}{8}$ - $\frac{1}{3}$ in. long, or 0 (i.e., base of leaf decurrent as a wing). Racemes 2-6 in. long, one-sided, frequently several forming a terminal panicle; lower flowers remote; lower pedicels often $\frac{1}{8}$ in. long; bracts minute. Sepals $\frac{1}{5}$ in. long, linear-lanceolate, pubescent or puberulous. Corolla lurid-purple to yellow or white; tube $\frac{3}{4}$ in. long, inflated for $\frac{2}{3}$ its length. Filaments nearly glabrous; anthers muticous. Style-base and ovary hairy. Capsule 1 in. long, pubescent; seeds $\frac{1}{8}$ in. in diam. or rather more.—*Nees in DC. Prod.* xi. 165; *Benth. in Hook. Niger Fl.* 478; *C. B. Clarke in Hook. f. Fl. Brit. Ind.* iv. 493; *Solms-Laub. in Schweinf. Beitr. Fl. Aethiop.* 104; *S. Moore in Trans. Linn. Soc. ser. 2, Bot.* iv. 31. *A. quaterna*, *Nees in DC. Prod.* xi. 166, 724; *Benth. in Hook. Niger Fl.* 478. *A. chelonoides*, var. δ *arabica*, *Nees in DC. Prod.* xi. 164. *A. calycina*, *Benth. in Hook. Niger Fl.* 478. *A. gangetica*, *T. Anders. in Thwaites, Enum. Pl. Zeyl.* 235, and in *Journ. Linn. Soc.* vii. 52; *S. Moore in Journ. Bot.* 1880, 308; *Engl. Hochgebirgsfl. Trop. Afr.* 392; *Lindau in Engl. Jahrb.* xviii. 63, t. 1, fig. 49, and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 326, fig. 131, and in *Engl. Pfl. Ost-Afr. C.* 370, and in *Ann. Istit. Bot. Roma* vi. [1896] 79. *A. podostachys*, *Klotzsch in Peters, Reise Mossamb. Bot.* 199. *A. subhastata*, *Klotzsch, l.c.* 200. *A. floribunda*, *Klotzsch, l.c.* 200. *A. acuminata*, *Klotzsch, l.c.* 201. *A. pubescens*, *Klotzsch, l.c.* 202. *A. scabrida*, *Klotzsch, l.c.* 202. *A. multiflora*, *Klotzsch, l.c.* 203. *A. querimbensis*, *Klotzsch, l.c.* 204. *Justicia gangetica*, *Linn. Amœn. Acad.* iv. 299. *Ruellia secunda*, *Vahl, Symb.* iii. 84. *R. quaterna*, *Schumach. Beskr. Guin. Pl.* 284. *Tyloglossa longipes*, *Hochst. ex Solms-Laub. l.c.*

Upper Guinea. Gambia, *Skues! Ingram!* Sierra Leone, *Afzelius! Don! Scott-Elliot*, 3895! 4990! Liberia, *Carder!* Cape Palmas, *Vogel*, 56! Gold Coast: Accra, *Buchholz!* Cape Coast Castle, *Vogel*, 9! Togoland, *Kling*, 4! Lagos: Eruwa, *Rowland! Millen*, 19! Yoruba, *Millson*, 71! Niger Territory: Nupe; Jeba, *Barter!* Niger Delta; Grand Bassa, *Vogel*, 87! River Nun, *Mann*, 501! Cameroons: Rio del Rey, *Johnston!* Victoria, *Preuss*, 1115! Batanga, *Bates*, 8! 9! Efulen, *Bates*, 359! Yaunde, *Zenker & Staudt*, 489! Fernando Po, *Mann*, 265!

Nile Land. Upper Senaar: Fazokl, *Kotschy*, 423! Eritrea: Mount Bizen, 4500 ft., *Schweinfurth & Riva*, 2000! Bogos, 5000 ft., *Hildebrandt*, 462! Abyssinia, *Schimper*, 199! *Parkyns!* Somaliland: River Daua, *Riva*, 1452! and without precise locality, *Miss Edith Cole!* British East Africa: Mittu; Mvolo, *Schweinfurth*, 2813! and at the River Moroko, *Schweinfurth*, 3980! Ribe, near Mombasa, *Wakefield!* Giriyama Mountains, *Gregory!* Witu, *Thomas*, 159! 188!

Lower Guinea. Princes Isle, *Newton*, 19! *Quintas*, 89! 93! Gaboon: Munda; Sibange Farm, *Büttner*, 452! 611! *Soyaux*, 190! 198! 198A! Angola, *Welwitsch*, 5050! 5131! 5160! 5170! 5196! 5206! *Mechow*, 53!

South Central. Congo Free State: Bangala, 1000 ft., *Hens*, 124! Bolobo, on the Congo, *Büttner*, 453! 454! Lulua River, *Pogge*, 1246!

Mozamb. Dist. Zanzibar, *Hildebrandt*, 980! *Stuhlmann*, 409! 1086! 1087! *Peters*! Mafia Island, *Bartle-Frere*! German East Africa: Kilimanjaro, 9000 ft., *Meyer*, 33! 5000 ft., *Volkens*, 710! Ugweno Mountain, *Meyer*, 171! Karagwe; Bukoba, *Stuhlmann*, 3677! 3938! Usambara; Tanga, *Holst*, 2063! *Volkens*, 7! 163! Mascheua, *Holst*, 8733! Usaramo; Dar-es-Salaam, *Stuhlmann*, 7602! 7665! 7698! 7701! Lake Tanganyika; Kavala Island, *Carson*, 27! Rovuma River, *Meller*! Portuguese East Africa: Zambesi Delta; River Luabo, *Kirk*, 34! Lower Valley of the River Shire, *Meller*! Boror, *Peters*! British Central Africa: Lake Nyasa, *Simon*! Urungu; Abercorn, *Carson*, 27! Nyasaland; Mount Mlange, *Whyte*! Shire Highlands, *Buchanan*, 321! Shire River, *Kirk*! and without precise locality, *Buchanan*, 872!

Also in Tropical Asia.

The corolla of this weed varies (in Africa as in Asia) greatly in size and in colour. The types of Klotzsch's species reduced have been seen.

2. **A. parvula**, *C. B. Clarke*. Hairy. Leaves up to $\frac{1}{2}$ by $\frac{1}{4}$ in., ovate, subpetioled. Raceme $1\frac{1}{2}$ in. long, with distant flowers; bracts hardly $\frac{1}{20}$ in. long. Calyx $\frac{1}{6}$ in. long, pubescent and with gland-tipped hairs. Corolla in total length $\frac{1}{2}$ in.; tube less than $\frac{1}{3}$ in. long. Stamens and pistil as of *A. coromandeliana*, Nees. Capsule less than $\frac{1}{4}$ in. long.

Nile Land. Somaliland: Adda Galla, *James & Thrupp*!

The anthers, pollen, stigmas, are identical with those of *A. coromandeliana*, of which even this may be a depauperated state.

3. **A. Buettneri**, *Lindau in Engl. Jahrb.* xx. 37. Hairy. Leaves 5 by 2 in., ovate; petiole $0-\frac{2}{3}$ in. long. Racemes 2 in. long, terminal, one-sided; pedicels scarcely $\frac{1}{16}$ in. long; bracts minute. Sepals 5, $\frac{1}{2}$ by $\frac{1}{10}$ in., linear-oblong, with long white hairs. Corolla white; tube $\frac{3}{4}$ in. long. Anthers minutely tailed at the base. Ovary with the style base very hairy.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 326.

Upper Guinea. Togoland, *Büttner*, 260! 283! *Kling*, 191!

This is allied to the large forms of *A. coromandeliana*, Nees (called formerly *A. calycina*, Benth.), but has larger flowers and very much larger sepals.

4. **A. congensis**, *C. B. Clarke*. Glabrous, except the puberulous corolla. Leaves $3\frac{1}{4}$ by 1 in., elliptic, acuminate at each end; petiole $0-\frac{1}{2}$ in. long. Raceme terminal, 3-flowered, peduncled; bracts hardly $\frac{1}{12}$ in. long, linear. Sepals $\frac{1}{8}$ in. long, linear-oblong, microscopically pubescent. Corolla-tube 1 in. long, puberulous. Stamens 4, subsimilar; outer cells parallel, muticous at the base; pollen of genus. Style hairy at the base; stigma 2, subglobose.

Lower Guinea. Lower Congo: Stanley Pool, *Callewaert*!

5. **A. linearis**, *S. Moore in Journ. Bot.* 1894, 136. About 2 ft. high. Branches tetragonal, puberulous. Leaves $2\frac{1}{2}-3$ by $\frac{1}{8}-\frac{1}{5}$ in., sessile,

linear-lanceolate or linear, nearly glabrous. Spike 2–2½ in. long, slender, interrupted; bracts ⅓ in. long; glabrous. Sepals ⅓ in. long, linear, puberulous. Corolla in total length ½ in. Anther-cells minutely mucronate at the base. Style hairy at the base.—Lindau in Engl. Pfl. Ost-Afr. C. 370.

Nile Land. British East Africa: Durama, 700 ft., *Gregory!*

6. **A. scandens**, *Hook. Bot. Mag. t. 4449.* A straggling shrub. Leaves up to 7 by 3 in., elliptic, narrowed at either end, young with white dots on the upper surface, when mature nearly glabrous; petiole 0–⅓ in. long. Inflorescence terminal, 2–3 in. long, often compound, viscous-pubescent, glandular; bract hardly ¼ in. long. Sepals ⅓ in. long, linear. Corolla pale mauve to white; tube ⅓ in. long, much inflated in the upper half. Anthers minutely tailed; pollen long-ellipsoid, of the genus, with obsolete tubercular markings, as in many species of *Justicia*. Ovary glabrous.—Benth. in *Hook. Niger Fl.* 478; T. Anders. in *Journ. Linn. Soc. vii.* 53; Lindau in *Engl. & Prantl, Pflanzenfam. iv.* 3 B. 326. *Henfreyia scandens*, Lindl. *Bot. Reg.* 1847, t. 31.

Upper Guinea. Sierra Leone: Talla Hills, *Scott-Elliot*, 4919! near Lumbaraya, 5012! George Water, *Scott-Elliot*, 4164! and without precise locality, *Barter! Don! Afzelius! Smeathman!*

7. **A. vogeliana**, *Benth. in Hook. Niger Fl.* 479. A straggling undershrub. Leaves up to 7½ by 2½ in., narrowed at either end, when mature nearly glabrous, with rows of minute cystoliths along the midrib on the upper surface; petiole 0–1½ in. long. Inflorescence terminal, compound, lax or straggling, 6–18 in. long, ultimate spikes or racemes 1-sided; bract ⅓ in. long. Sepals ¼–⅓ in. long, linear, densely and minutely glandular pubescent. Corolla pale purple to white; tube 2 in. long, slender, the upper ⅓ part funnel-shaped. Anthers mucronate at the base, hardly tailed. Ovary glabrous; a very few microscopic bristles on the style-base. Capsule 1–1¼ in. long.—T. Anders. in *Journ. Linn. Soc. vii.* 53; Lindau in *Engl. & Prantl, Pflanzenfam. iv.* 3 B. 326; Cummins in *Kew Bulletin*, 1898, 77. *A. kalantha*, Lindau in *Engl. Jahrb.* xxiv. 321.

Upper Guinea. Ashanti: Assin-Yan-Coomassie, *Cummins*, 79! Togoland, *Baumann*, 374! Lagos; Abeokuta, *Irving!* near Lagos, *Rowland!* Niger Delta: Angiama, *Barter*, 2096! Cameroons: Efulen, *Bates*, 449! Cameroon Mountains, 3000 ft., *Mann*, 1955! Fernando Po, *Vogel*, 211! *Mann*, 47!

8. **A. longituba**, *Lindau in Engl. Jahrb.* xxii. 118. Ovary with many brown sessile glands nearly to the base. Capsule glandular; otherwise as *A. vogeliana*.

Upper Guinea. Cameroons: Yaunde, 2500 ft., *Zenker & Staudt*, 410! 587! 587A! 587B! between Victoria and Bota, *Preuss*, 1363!

Lindau says this is distinct from all other African *Asystasias* by the length of the flowers; but they are not quite so long as those of *A. vogeliana*. The cystoliths, on the upper surface of the leaf along the midrib, are much fewer.

9. **A. macrophylla**, Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 326. Shrub up to 10 ft. high. Leaves up to 14 by $4\frac{1}{2}$ in. (commonly $\frac{2}{3}$ this size), elongate-obovate, acuminate, when mature glabrous shining; petiole 0– $1\frac{1}{2}$ in. long. Panicle 4–8 in. long, linear, minutely rusty hairy, lower small cymes $\frac{1}{4}$ in. long, distant; bract $\frac{1}{8}$ in. long, linear. Sepals $\frac{1}{4}$ in. long, linear, minutely rusty. Corolla purple to white; tube $1\frac{1}{4}$ in. long, dilated in the upper half. Anthers 2-celled; cells parallel, each with 2 tails at the base; pollen small, short-ellipsoid, more trigonous than in the preceding species. Ovary glabrous; ovules 2 in each cell.—*Dicentranthera macrophylla*, T. Anders. in Journ. Linn. Soc. vii. 52; Hook. f. Bot. Mag. t. 5696.

Upper Guinea. Cameroons: Batanga, Bates, 140! Bipindi, Zenker, 825! Johann Albrechts-Höhe, Staudt, 470! Victoria, Preuss, 1146! 1179! 1365! Yaunde, Zenker, 427! 655! Zenker & Staudt, 200A! 639! River Cameroon, Mann, 2197! Fernando Po, Mann, 13!

Lower Guinea. Gaboon: Munda; Sibange Farm, Soyaux, 291! Büttner, 351! 358! Gaboon River, Mann!

Ovules 4–6 in ovary (*T. Anderson*), 4 in each cell (*J. D. Hooker*). I find 2 in each cell, as Bentham and Lindau state.

10. **A. africana**, C. B. Clarke. Herb, 2–3 ft. high. Leaves up to $3\frac{3}{4}$ by $1\frac{1}{3}$ in., narrowed at either end, mature pubescent on the midrib beneath, otherwise glabrous; petiole $\frac{1}{4}$ –1 in. long. Inflorescence terminal, lax; spikes $1\frac{1}{2}$ in. long, paniced, not unilateral; bracts hardly $\frac{1}{16}$ in. long, linear. Calyx $\frac{1}{12}$ in. long; lobes 5, lanceolate, minutely pubescent. Corolla nearly $\frac{2}{3}$ in. long; tube $\frac{1}{3}$ in. long. Anthers oblong, parallel, obscurely mucronate at the base; pollen of the genus. Ovary glabrous; 2 ovules in each cell; style-branches short, oblong, subconnate. Capsule 1 in. long, 4-seeded; stalk $\frac{1}{2}$ in. long, solid; seeds tubercular-scabrous, without hairs.—*Isochoriste africana*, S. Moore in Journ. Bot. xviii. 1880, 309; Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 326.

Lower Guinea. Angola: Pungo Andongo, Welwitsch, 5073! 5078! 5079!

11. **A. Welwitschii**, S. Moore in Journ. Bot. 1880, 308. Herb, 2–4 ft. high. Stem quadrangular, microscopically pubescent, and with cystoliths. Leaves $2\frac{3}{4}$ by $\frac{3}{4}$ –1 in., suddenly narrowed at the base, scabrid hairy above, more hairy beneath with parallel raised primary nerves. Petiole hardly any. Spikes terminal and peduncled axillary, $2\frac{1}{2}$ –7 by $\frac{1}{2}$ –1 in., 10–60-flowered, sometimes branched, forming a terminal compound spike, shortly hairy; bracts $\frac{1}{4}$ in. long, ovate, acute. Sepals $\frac{1}{3}$ – $\frac{1}{2}$ in. long, linear-lanceolate. Corolla rose-white (*S. Moore*); tube $\frac{3}{4}$ in. long. Anthers shortly tailed. Capsule $1\frac{1}{4}$ in. long, 4-seeded, very minutely pubescent.—Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 326.

Lower Guinea. Angola: Pungo Andongo and Huilla, Welwitsch, 5039, 5105, 5188! Pungo Andongo, Mechow, 46! Malange, Buchner, 123! Pogge, 302! Huilla, Antunes, 177! Newton!

12. **A. Charmian**, S. Moore in Journ. Bot. 1880, 38. Hairy. Stem quadrangular. Leaves up to $3\frac{1}{4}$ by $\frac{3}{4}$ in., narrow-elongate-

elliptic, tapering at both ends; petiole $0-\frac{1}{6}$ in. long. Spike 5 in. long, terminal, flowers in opposite pairs, lower distant; pubescent with some shaggy white hair on the calyces; bracts $\frac{1}{5}$ in. long, ovate, hardly acute. Sepals $\frac{1}{3}$ in. long, linear-lanceolate. Corolla-tube $\frac{3}{4}$ in. long, inflated for more than half its length. Anthers shortly tailed; pollen small, shortly ellipsoid, trigonous. Ovary (in the upper half) with much long white hair.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 326, and in Engl. Pfl. Ost-Afr. C. 370.

Nile Land. British East Africa: Ukamba; Kitui, *Hildebrandt*, 2724!

13. **A. Schimperi**, *T. Anders. in Journ. Linn. Soc.* vii. 53. Erect annual 6–8 in. high, sparsely hairy. Leaves up to $2\frac{1}{4}$ by $\frac{3}{4}$ in., ovate or oblong, narrowed at both ends; petiole $0-\frac{1}{4}$ in. long. Spikes terminal, 1–2 in. long, rather dense; bracts up to $\frac{1}{2}-\frac{2}{3}$ by $\frac{1}{5}$ in., narrowly elliptic; bracteoles $\frac{1}{3}$ in. long, falcate-lanceolate. Sepals $\frac{1}{6}-\frac{1}{5}$ in. long, linear, minutely pubescent, membranous. Corolla-tube $\frac{1}{3}$ in. long, dilated upwards. Anthers minutely mucronate at the base; pollen short-ellipsoid, trigonous. Ovary hairy. Capsule $\frac{3}{4}$ in. long 4-seeded, pubescent.—*Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 345* (var. *minor*, *Oliv.*). *A. rostrata*, *Solms-Laub. in Schweinf. Beitr. Fl. Aethiop.* 242; *Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 326*, and in *Engl. Pfl. Ost-Afr. C. 370*. *Adhatoda rostrata*, *Solms-Laub. in Schweinf. Beitr. Fl. Aethiop.* 104. *Tyloglossa rostrata*, *Hochst. ex Solms-Laub. l.c.* 104.

Nile Land. Eritrea: Bogos, 5500 ft., *Schweinfurth*, 455! Keren, *Steudner*, 1495! Abyssinia: Tigre; Goelleb, 4000 ft., *Schimper*, 2220! Jelajeranne, *Schimper*, 1657, 1659! and without precise locality, *Schimper*, 140! 367! 382! 1629! British East Africa: Uganda, *Scott-Elliott*, 7276! Lake Elmeteita, 6000 ft., *Scott-Elliott*, 6636! Kamasia, *Gregory*!

Mozamb. Dist. German East Africa: Usmawo; Kageyi on Lake Victoria Nyanza, *Fischer*, 494! Kilimanjaro, 4000–5000 ft., *Johnston*!

Var. β *Grantii*, C. B. Clarke. Branch 18 in. long. Spikes 3 in. long; bracts up to $\frac{3}{4}$ in. long.—*A. Schimperi*, *Oliv. in Trans. Linn. Soc. xxix. 131*. *Justicia*, sp. n. 2, T. Thoms. in *Speke, Nile Append. 643*. *Parasystasia Kelleri*, *Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 307*, and in *Engl. Jahrb. xxiv. 321*.

Nile Land. British East Africa: Unyoro, *Speke & Grant*, 603! Somaliland, *Keller*, 189!

This approaches in size the next species (*A. Coleæ*), but appears annual.

14. **A. Coleæ**, *Rolfe in Kew Bulletin*, 1895, 223. Branches woody, $\frac{1}{8}$ in. in diam.; branchlets 12–15 in. long. Leaves broad-elliptic, narrowed at the base, or round ovate suddenly contracted at the base. Spikes $2\frac{3}{4}$ by 1 in., bracts $\frac{1}{2}-\frac{2}{3}$ in. long. Corolla in total length $\frac{3}{4}-1$ in. Pollen oblong-ellipsoid, subterete. Capsule 1 in. long or rather more.—*Barleria somalensis*, *Franch. Sert. Somal. 51*. *Parasystasia somalensis*, *Baill. Hist. Pl. x. 461*; *Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 325*, and in *Ann. Istit. Bot. Roma vi. (1896) 78*.

Nile Land. Somaliland: Golis Range, *Mrs. Lort-Phillips! Miss Cole! Adda Galla, James & Thrupp!* between Jaribule and Harr, *Riva*, 191!

Very near the preceding species, but larger and with woody branches.

15. **A. anellioides**, *C. B. Clarke*. Sparingly minutely pubescent. Branches 1 ft. long, weak. Leaves 2 by 1 in., ovate; petiole $\frac{1}{3}$ in. long. Spikes axillary, 2 in. long, slender, glabrate, 2-flowered; flower subsessile; bracts scarcely $\frac{1}{8}$ in. long. Sepals 5, linear, nearly $\frac{1}{3}$ in. long, minutely, thinly scabrous, hairy. Corolla white, in total length $\frac{1}{2}$ – $\frac{2}{3}$ in.; tube somewhat inflated from the base. Stamens 4; anther-cells 2, oblong, mucicous, at equal height. Capsule $\frac{3}{4}$ in. long, stalked, 4-seeded, retrorsely thin hairy; seeds $\frac{1}{6}$ in. in diam., flattened, trapezoid, tubercular-scabrous, margins thickened, smooth.—*A. coromandeliana*, Balf. f. in Trans. Roy. Soc. Edin. xxxi. 217, partly.

Nile Land. British East Africa: Tana River, *Thomas*, 30!

Inflorescence and habit of *Justicia*, sect. *Ansellia*.

34. **FILETIA**, Miq.; Benth. et Hook. f. Gen. Pl. ii. 1101.

Anther-cells not parallel at equal height; inflorescence a very narrow panicle; otherwise (so far as known) equal to *Asystasia*.

Species 2; the type species in Java, one in West Africa.

This genus is only known from Miquel's account, which describes neither the æstivation of the corolla, the pollen, nor the fruit. Lindau refers to this genus the Kamerun species below (of which the fruit is unknown).

1. **F. africana**, *Lindau in Engl. Jahrb.* xx. 41. Bush, 2–4 ft. high. Branches slender, glabrate and with lines of crisped pubescence. Leaves up to 7 by $1\frac{1}{2}$ –2 in., from oblong to elliptic, pinnately nerved, margin entire wavy, base obtuse, tip acuminate, crisped hairy on the midrib above, very minutely hairy on the nerves beneath; petiole up to $\frac{3}{4}$ in. long. Panicle 3 by $\frac{1}{2}$ in., minutely hairy, terminal; peduncle 1 in. long; bracts up to $\frac{1}{8}$ in. long., oblong; lateral panicle-branches $\frac{1}{5}$ in. long, 1–4-flowered. Calyx scarcely $\frac{1}{6}$ in. long, divided nearly to the base, pubescent; sepals 5, linear, equal. Corolla-tube $\frac{1}{4}$ – $\frac{1}{3}$ in. long, narrow; lobes $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Stamens 4, didynamous; filaments glabrous; anthers all 2-celled, mucicous; those on the longer filaments have cells ellipsoid, one much above the other, the upper ciliate on the slit, those on lower filaments have cells orbicular, divergent, a little distant on the connective; pollen ellipsoid, 3-banded. Pistil glabrous; style shortly bifid; ovules 2 in each cell; disc $\frac{1}{4}$ the height of the ovary. Fruit unknown.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 335.

Upper Guinea. Cameroons: Quaqua, *Buchholz!*

Lower Guinea. Gaboon: Como River, *Bates*, 495!

35. **NEURACANTHUS**, Nees; Benth. et Hook. f. Gen. Pl. ii. 1093.

Calyx in two pieces; posticous lip 3-fid or nearly entire; anticous lip 2-fid or nearly entire. Corolla $\frac{1}{3}$ – $\frac{2}{3}$ in. in total length, upper half funnel-shaped with 5 short triangular lobes, plicate; lobes 3-nerved connected by nerveless membranous intermediate portions. Stamens 4; 2 anticous with 2-celled anthers; 2 posticous with 1-celled anthers; anther-cells oblong, muticous; connective, often puberulous; filaments usually sparsely hairy; pollen somewhat tetrahedroid or nearly globose, smooth or obscurely reticulate, without meridional depressions. Ovary glabrous; ovules 2–1 in each cell; style short, glabrous; stigma of one oblong lobe. Capsule $\frac{1}{3}$ in. long or less, ovoid, compressed, beaked, 4- (or generally 2-) seeded. Seeds discoid, covered with hairs in tufts, each hair spirally marked within, unrolling on applying water.—Small shrubs, varying much in general appearance, leaves, indumentum and inflorescence; very uniform in the structure of the flowers. Inflorescence of condensed unilateral spikes, or of few-flowered elongated spikes, or reduced to a single flower, strobilate or scattered; bract ovate or linear, sometimes spinous; bracteoles 0.

Species 12, in Tropical Africa and India.

Bracts ovate or obovate, never reduced to linear spines.

Spikes 2 in. long, definitely strobilate.

- | | |
|---|----------------------------|
| Spike $\frac{1}{4}$ in. broad, with small white hairs | 1. <i>N. africanus</i> . |
| Spike $\frac{3}{4}$ in. broad, with long tawny hairs | 2. <i>N. decorus</i> . |
| Spike $\frac{2}{3}$ in. broad, grey-villous | 3. <i>N. strobilinus</i> . |

Spikes in ovoid heads.

Heads axillary, sessile.

- | | |
|--|---------------------------|
| Stem and leaves minutely scabrous beneath | 4. <i>N. scaber</i> . |
| Stem and leaves with many-celled hairs beneath | 5. <i>N. ukambensis</i> . |
| Stem and leaves white-tomentose beneath | 6. <i>N. niveus</i> . |
| Heads on short lateral branches | 7. <i>N. Lindau</i> . |

Bracts spinescent, if sterile reduced to linear spines.

(Young parts at least white-stellate-tomentose.)

- | | |
|---|-----------------------------|
| Fertile spikes 1-flowered | 8. <i>N. polyacanthus</i> . |
| Fertile spikes strobilate, few-flowered | 9. <i>N. Robecchii</i> . |

1. ***N. africanus***, *S. Moore in Journ. Bot.* 1880, 37. Branches slender, woody, minutely pubescent. Leaves $4\frac{3}{4}$ by 2 in., narrowed at both ends, entire, minutely pubescent on the nerves beneath, otherwise glabrous, cystoliths conspicuous on both faces, base narrow, cordate-truncate; petiole 0– $\frac{1}{8}$ in. long. Spikes 2 by $\frac{1}{4}$ in., axillary, linear-cylindric, strobilate, apparently simple; bract $\frac{1}{3}$ in. long, obovate, suddenly subspine-tipped. Calyx $\frac{1}{3}$ in. long, in 2 pieces, slightly hairy; anticous piece shortly 2-toothed; posticous shortly 3-toothed. Pollen subglobose, without longitudinal depressions, obscurely reticulate. Capsule $\frac{1}{3}$ in. long, 2-seeded.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315. *Barleria Sacani*, Klotzsch ex Lindau in Engl. Pfl. Ost-Afr. C. 368.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; Lupata, *Kirk!* Tete, *Peters!*

2. **N. decorus**, *S. Moore in Journ. Bot.* 1880, 307. Branchlets fulvous-scabrous. Leaves up to 4 by 1 in., oblong-elliptic, entire, fulvous-scabrous on the nerves beneath; cystoliths on both faces; petiole $0-\frac{1}{6}$ in. long. Spikes terminal on axillary branches, 2 by $\frac{3}{4}$ in., rather densely strobilate, fulvous-hairy; bract $\frac{1}{3}-\frac{1}{2}$ in. long, ovate, subacute. Calyx $\frac{1}{4}-\frac{1}{3}$ in. long, in 2 pieces, densely fulvous-hairy; anticous segment divided $\frac{2}{3}$ its length into 2 lanceolate teeth; posticous segment divided $\frac{2}{3}$ its length into 3 lanceolate teeth. Pollen globose, smooth, without longitudinal depressions.

Lower Guinea. Angola: Loanda; between Lake Ivantala and Quilongues, *Welwitsch*, 5057!

3. **N. strobilinus**, *C. B. Clarke*. Branches 6 in. long, simple, scabrous hairy. Leaves $3\frac{1}{2}$ by $1\frac{2}{3}$ in., obovate-elliptic, greenish-yellow, scabrous hairy on the nerves, tip obtuse or triangular-apiculate, base tapering; petiole 0. Spike terminal, sessile, $2\frac{1}{2}$ by $\frac{3}{4}$ in., strobilate, very dense; bract $\frac{2}{3}$ in. long, ovate, acute, mucronate, 5-nerved, hairy. Calyx $\frac{1}{3}$ in. long, anticous lip 2-fid half-way down, posticous 3-fid half-way down, hairy without and within. Pollen globose, smooth, without longitudinal depressions; stopples 3. Pistil $\frac{1}{6}-\frac{1}{5}$ in. long; one style branch oblong, the other suppressed; style-base subarticulated, suddenly contracted above the ovary. Capsule $\frac{1}{3}$ in. long, ellipsoid-oblong, compressed, sessile, glabrous, black, shining, 2-seeded; seeds covered with very slender hygroscopic hairs.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 5000-6000 ft., *Whyte*, 138!

The corollas (with stamens) have all fallen, but from the very short styles were doubtless small.

4. **N. scaber**, *S. Moore in Journ. Bot.* 1880, 307. Branches rather stout, pubescent. Leaves up to 3 by $1\frac{3}{4}$ in., ovate, entire, minutely scabrous on the nerves beneath; cystoliths obscure; petiole $0-\frac{1}{4}$ in. long. Inflorescence in dense axillary heads 1 in. in diam., made up of condensed unilateral spikes, not (or only in fruit obscurely) strobilate; bract $\frac{1}{2}-\frac{2}{3}$ in. long, ovate, acute, hairy, mucronate, not spinous. Calyx $\frac{1}{3}$ in. long, of two pieces, softly hairy; anticous piece divided more than half-way down into 2 lanceolate teeth; posticous piece divided less than $\frac{1}{3}$ way down into 3 short teeth. Pollen globose, smooth, without longitudinal depressions. Capsule $\frac{1}{3}$ in. long, 2-seeded.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 315, fig. 108, B, and in *Engl. Pfl. Ost-Afr.* C. 369 partly.

Lower Guinea. Angola: Loanda, *Welwitsch*, 5064! 5125! 5128! 5171!

Mozamb. Dist. German East Africa: Kilimanjaro, 2000-3500 ft., *Volkens*, 549! 2215!

5. **N. ukambensis**, *C. B. Clarke*. Branchlets very woody, with many-celled hairs. Leaves 2 by 1 in., acute at either end, subsessile, finally nearly glabrous except the many-celled hairs on the nerves beneath; main nerves 5 or 6 pairs. Heads $\frac{2}{3}$ in. in diam., on very

short lateral branches, with many-celled hairs and also long needle-like one-celled hairs; bracts $\frac{1}{4}$ – $\frac{1}{3}$ in. long, broadly obovate, shortly apiculate, 3-nerved as the hairs wear off. Calyx and corolla nearly as of *N. scaber*.

Nile Land. British East Africa: Ukamba, *Hildebrandt*, 2723!

This has been put with *N. scaber*, S. Moore.

6. **N. niveus**, *S. Moore in Journ. Bot.* 1880, 37. White stellate-tomentose; branches 2 ft. long, from a short woody rootstock. Leaves up to 4 by $2\frac{1}{2}$ in., broadly elliptic, acute, entire, upper surface finally glabrate with subconspicuous cystoliths; petiole $0-\frac{1}{4}$ in. long. Inflorescence of dense axillary heads $1-1\frac{1}{2}$ in. diam., with long white hair, made up of few-flowered condensed unilateral spikes; bract $\frac{1}{3}-\frac{1}{2}$ in. long, ovate, acute, soft mucronate, dark brown. Calyx $\frac{1}{4}-\frac{1}{3}$ in. long, of 2 pieces, each divided rather more than $\frac{1}{2}$ way down; teeth 5, linear-lanceolate, long hairy. Pollen globose-subtrigonus, smooth, without longitudinal depressions. Pistil of genus.—*Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315.*

Nile Land. British East Africa: Jur; Jur Ghattas, *Schweinfurth*, 1963!

7. **N. Lindau**, *C. B. Clarke*. Stem and young leaves densely white-tomentose. Mature leaves $2\frac{1}{2}$ by 1 in.; tip triangular; base tapering into a petiole $\frac{1}{2}$ in. long; main nerves about 9 pairs, finally nearly glabrate above. Heads hardly 1 in. in diam., on short lateral branches, white woolly; bracts substrobilate $\frac{1}{4}-\frac{1}{3}$ in. long, broadly obovate, shortly apiculate, obscurely 3-nerved as the white wool wears off. Calyx and corolla as in *N. niveus*.—*Leucobarleria nivea*, *Lindau in Ann. Istit. Bot. Roma vi. [1896] 77*, and in *Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 306*, not *Neuracanthus niveus*, S. Moore.

Nile Land. Somaliland: between Danna and Ueb (River) Karanle, *Riva*, 945!

8. **N. polyacanthus**, *C. B. Clarke*. Harsh branched shrub 10 in. in diam.; young parts white stellate-tomentose. Leaves $\frac{3}{4}-1$ by $\frac{2}{3}$ in., ovate, entire, when mature glabrate; petiole $0-\frac{1}{4}$ in. long. Inflorescences in axillary prickly heads, $\frac{3}{4}$ in. in diam., made up of 1-flowered and sterile unilateral scorpioid cymes; sterile spike “flexuous many-prickled pubescent spine” of *Lindau*; fertile spike nearly same with 1 flower at the base; bract linear, $\frac{1}{5}$ in. long. Calyx $\frac{1}{4}-\frac{1}{3}$ in. long; segments 2, ovate, acute, subsimilar, subentire; anticous 2-nerved; posticous 3-nerved. Pollen globose-subtrigonus, smooth, without longitudinal depressions. Capsule $\frac{1}{4}-\frac{1}{3}$ in. long, ovoid, acute, hardly beaked, 2-seeded, compressed, shining brown.—*Leucobarleria polyacantha*, *Lindau in Ann. Istit. Bot. Roma vi. (1896) 77*, and in *Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 306*; *Rendle in Journ. Bot.* 1896, 413.

Nile Land. Somaliland: Terfa Torrent-bed, *Donaldson Smith!* Ogaden, *Robecchi*, 240! Elba, *Riva*, 914! Abdallah, *Keller*, 198!

9. **N. Robecchii**, *C. B. Clarke*. Young parts white stellate-tomentose. Leaves $1\frac{1}{2}$ by $\frac{2}{3}$ in., oblong-elliptic, when mature sparingly hairy, margin wavy-crenate, tip subobtuse, base tapering; petiole $0-\frac{1}{2}$ in. long. Sterile spikes scorpioid, appearing as flexuous, many-prickled pubescent spines; fertile spike $\frac{3}{4}$ in. long, strobilate, few-flowered; bract $\frac{1}{3}$ in. long, subquadrate, suddenly spine-tipped. Calyx $\frac{1}{3}$ in. long, woolly, of 2 pieces; anticous oblong 2-nerved, scarcely 2-toothed; posticous ovate, 3-nerved, microscopically 3-toothed. Capsule $\frac{1}{3}$ in. long, narrow-ovoid, acute, 2-seeded. Seeds densely woolly with hygroscopic hairs.—*Leucobarleria Robecchii*, Lindau in Ann. Istit. Bot. Roma vi. (1896) 78, and in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 306.

Nile Land. Somaliland: Marehan, *Robecchi*, 238A! 239A! 258.

Also in Arabia.

36. **BARLERIA**, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1091.

Calyx of 4 distinct segments, large; anticous segment of 2 sepals, connate quite or three-quarters of the way to the tip; posticous segment subsimilar; 2 lateral segments within, narrow, usually much smaller. Corolla yellow or blue; tube cylindric or the upper part funnel-shaped; limb of 5 subequal segments or 2-lipped; anticous segment wholly within in bud. Stamens 2, complete; filaments stout glabrous or nearly so; anthers exserted, linear-oblong, parallel, muticous; pollen globose, honeycombed; 2 (or 3) imperfect short stamens added, with anthers rudimentary or small, very rarely perfecting a little pollen. Ovary glabrous, except the tip, with 2 (or 1) ovules in each cell; disc often large, cup-shaped; style long, glabrous, rarely hairy towards the base; stigmas 2, short, linear, subequal, often subconfluent. Capsule either ovoid, 2-seeded, or oblong-ellipsoid, 4-seeded; seeds shaggy, usually all over, hairs (often in bundles) more or less elastic on applying water.—Leaves entire, without prickles or teeth (in the Tropical African species). Inflorescence (when fully developed) of axillary scorpioid cymes, often condensed almost to a head, or shortened to few (or 1) flowers when the inflorescence appears like a simple spike; bracts 1 fertile, 1 sterile, as simple or branched spines, or entire, or toothed, or pinnatifid leaves; bracteoles 0.—*Somalia*, Oliv. in Hook Ic. t. 1528.

Species 120, mostly in Africa and Tropical Asia, a few in Tropical America.

In the fully-developed axillary raceme, the lowest pair of bracts are opposite, supporting a terminal shortly pedicelled flower without bracteoles; from the axil of one bract a shoot carries two similarly opposite bracts which may support another flower or (not rarely) terminate the raceme. Where the raceme is many-flowered it is often very dense, and of each pair of bracts the sterile one is twisted on one side. In some common species (as in *B. Prionitis*) the inflorescence is so completely a simple spike that the bracts have been regarded as bracteoles; and it is merely by analogy that they are here called bracts. Sterile inflorescences may, in most species, carry 2, 3 or 4 bracts, according as the second joint is more or less evolved. In most of the invariably 2-seeded species, of the subgenera *Prionitis* and *Somalia* (hitherto

described as having ovules solitary), the seed in each cell appears basal, the capsule having a long empty or solid beak above it. But in most of these species the ovary has 2 ovules in each cell, whereof the lower is very much smaller; in each capsule-valve of the ripe fruit a seed is in one cell, and lower down in the other cell the minute point, representing the small ovule that came to nothing, is not difficult to see.

Series A. Interpetiolar spines (i.e., reduced leaves of sterile shoots), simple or pinnatifid, often present. Posticous sepal often spine-tipped or spine-toothed on margin.

*PRIONITIS.—Lower ovule in each cell minute or 0; capsule never having more than 2 seeds, ovoid with conic beak. Posticous sepal usually spine-tipped, rarely spine-toothed on margin.

†Bracts next the calyx (bracteoles) rigid spines, simple or rarely with one lateral basal spiny tooth.

Corolla 2-lipped; 4 posticous segments in one lip; anticous segment clawed, springing from the tube lower down.

Corolla yellow-orange or brownish-red.

Floral leaves elliptic or oblong, hardly imbricate.

Leaves glabrate.

Spines of barren shoots $\frac{1}{4}$ – $\frac{3}{4}$ in. long 1. *B. Prionitis*.

Spines of barren shoots often paired, up to 1 in. long 3. *B. diacantha*.

Leaves hairy.

Leaves sparsely hairy; filaments hairy 2. *B. proxima*.

Leaves densely hairy beneath; filaments glabrous 4. *B. induta*.

Floral leaves broad, imbricate; spikes shortly substrobilate.

Floral leaves broadly ovate, glabrous 5. *B. trispinosa*.

Floral leaves obovate, when young strigose 6. *B. senensis*.

Corolla blue or purplish-blue.

Corolla-tube $\frac{1}{2}$ in. long 7. *B. Smithii*.

Corolla-tube 1 in. long 8. *B. hererorensis*.

Corolla subequally 5-fid yellow; tube linear, not inflated upwards 9. *B. eranthemoides*.

††Bracts next the calyx linear, simple, green, hardly spinous.

Stem and leaves glabrous or nearly so 11. *B. setigera*.

Stem and leaves hairy.

Floral leaves minutely hairy 10. *B. quadrispina*.

Floral leaves plumose with long white hairs 12. *B. waggana*.

†††Bracts next the calyx linear spines, often with 1–2 spinous teeth 13. *B. triacantha*.

**ACANTHOIDEA.—Ovary with 2 similar ovules in each cell; capsule (except by accident) perfecting more than 2 seeds.

†Bracts next a flower simple spines (see also *B. Marlothii* and *B. Kirkii*). Hairs simple, often finer white hairs with long tawny hairs mixed or on the young parts (except *B. longissima*). Flowers (said to be) axillary solitary—i.e., axillary racemes reduced to 1-flower with or without a rudiment of a second, very rarely 2-flowered.

- Leaves many up to 1 in. in length.
- Leaves 2 in. long; posticous sepal spine-toothed 14. *B. grandicalyx*.
- Leaves 1 in. long; posticous sepal entire 14. *B. grandicalyx*, var.
- Leaves 1 in. long; posticous sepal spine-toothed 15. *B. mucronata*.
- Leaves (at least all the upper seen) scarcely 1 in. long.
- Posticous sepal spine-toothed.
- Posticous sepal $\frac{1}{3}$ in. long, silky hairy 16. *B. ramulosa*.
- Posticous sepal $\frac{3}{4}$ in. long, membranous, veined 17. *B. nyasensis*.
- Posticous sepal hardly spinous.
- Spines slender, glabrescent 18. *B. buxifolia*.
- Spines simply hairy; leaves very thick and hairy 19. *B. crassa*.
- Spines gland-hairy; corolla-tube 4 in. long 20. *B. longissima*.
- Racemes unilateral, several-flowered 21. *B. blepharoides*.
- †† Bracts next a flower toothed or compound spines, or toothed or pinnatifid leaves. Racemes several-flowered, often many-flowered.
- Posticous sepal not, or occasionally very sparingly, spine-toothed.
- Posticous sepal $\frac{1}{4}$ in. broad, lanceolate 22. *B. Marlothii*.
- Posticous sepal $\frac{1}{2}$ in. broad, ovate 23. *B. acanthoides*.
- Posticous sepal spine-toothed, papery, reticulate-nervose.
- Innovations and leaves stellate-hairy beneath except in age.
- Stems shortly hairy or finally glabrate.
- Leaves hardly 1 in. long; posticous sepal $\frac{1}{8}$ in. wide 24. *B. Kirkii*.
- Leaves up to 2 in. long; posticous sepal $\frac{1}{3}$ – $\frac{1}{2}$ in. wide 25. *B. spinulosa*.
- Leaves 3 in. long, with prominent cystoliths beneath 26. *B. Clivorum*.
- Stem with spreading white hairs $\frac{1}{10}$ – $\frac{1}{8}$ in. long 27. *B. consanguinea*.
- Stellate hairs none or very few.
- Heads axillary, dense, subcapitate.
- Posticous sepal $1\frac{1}{2}$ in. long 28. *B. capitata*.
- Posticous sepal $\frac{2}{3}$ in. long 29. *B. Steudneri*.
- Heads axillary, manifestly unilateral, racemose.
- Leaves less than 1 in. long, spine-tipped
- Villous; corolla-tube $1\frac{3}{4}$ in. 30. *B. mucronifolia*.
- Shortly canescent; corolla-tube $1\frac{1}{4}$ in. 31. *B. homoiotricha*.
- Leaves 3 in. long, and upwards.
- Posticous sepal scarcely $\frac{1}{3}$ in. wide, deeply spinous 32. *B. elegans*.
- Posticous sepal $\frac{2}{3}$ in. wide, shallowly spine-toothed 33. *B. carruthersiana*.
- Heads terminal, short-cylindric, dense 34. *B. flava*.

Series B. Spineless. Bracts and sepals entire or scarcely toothed.

*SOMALIA.—Lower ovule in each cell minute or 0; capsule never having more than 2 seeds, small ovoid with

linear beak ; ovary densely and minutely hairy ; capsule minutely hairy or nearly glabrate.

Hairs simple, with some (especially on the leaf-margins) attached by their centre.

Leaves sessile.

Leaves oblong or linear-oblong 35. *B. argentea*.

Leaves ovate-elliptic 36. *B. parviflora*.

Leaves shortly petioled.

Outer sepal truncate at the base 37. *B. Hochstetteri*.

Outer sepal distinctly cordate 38. *B. orbicularis*.

Many glandular hairs 39. *B. glandulifera*.

**EU-BARLERIA.—Ovary with 2 similar ovules (or the lower smaller) in each cell ; capsule (not known to be rostrate) frequently perfecting 4 seeds. Hairs simple or stellate, none canescent and attached by their centre. (The capsule is not known in many species below, and is sometimes 2-seeded, sometimes 4-seeded. In a large number of species the lower ovule is smaller and the capsule probably 2-seeded. On the other hand, the whole *B. repens* group (nos. 67–72) appear to be normally 4-seeded. This variability is strongly against the admission of *Somalia* as a genus.)

†*Glabratae*.—Mature leaves glabrate, or with small bristles on the nerves. Flowers and leaves usually large or medium (smaller in *B. cyanea* and *B. Lugardii*).

Species of Lower Guinea (chiefly Welwitschian from Angola).

Flowers clustered towards the ends of the branches.

Leaves ovate ; anticous calyx-segment 1 in. long . 40. *B. polyneura*.

Leaves lanceolate ; anticous calyx-segment $\frac{3}{4}$ in. long.

Anticous calyx-segment 2-lobed 41. *B. violascens*.

Anticous calyx-segment entire 42. *B. obtusisepala*.

Leaves spathulate-elliptic 43. *B. Welwitschii*.

Lower flowers axillary.

Leaves up to $5\frac{1}{2}$ by 2 in. 44. *B. alata*.

Leaves 1 by $\frac{1}{4}$ in. 45. *B. cyanea*.

Species of East and South Tropical Africa.

Leaves subsessile, almost truncate at the base.

Leaves oblong ; posticous sepal $1\frac{1}{2}$ in. long . 46. *B. calophylla*.

Leaves elliptic ; posticous sepal 1 in. long . 47. *B. calophylloides*.

Leaves petioled, narrowed at the base.

Corolla-tube 2 in. long 48. *B. grandis*.

Corolla-tube $\frac{2}{3}$ in. long 49. *B. Mackenii*.

Leaves scarcely petioled, narrowed at the base.

Corolla exceeding 1 in. in length.

Leaves 3 by $\frac{1}{3}$ in., linear-lanceolate 50. *B. marginata*.

Leaves 2 by 1 in., elliptic 51. *B. ukamensis*.

Corolla scarcely $\frac{3}{4}$ in. in total length 52. *B. Lugardii*.

††*Stellato-hirtæ*.—Innovations (at least) stellately hairy.

Flowers in ovoid dense heads.

Outer floral leaves broadly ovate, much imbricated.

- Floral leaves, thick, brown-red, viscid 53. *B. stellato-tomentosa*.
 Floral leaves white-ciliate 54. *B. stelligera*.
 Floral leaves ultimately papery 55. *B. albostellata*.
 Outer floral leaves elliptic, but little imbricated.
 Leaves apiculate; calyx $\frac{3}{4}$ in. long 56. *B. salicifolia*.
 Leaves obtuse; calyx $\frac{1}{2}$ in. long 57. *B. Hildebrandtii*.
 Flowers in short unilateral axillary cymes 58. *B. fulvostellata*.
- ††† *Villosæ*.—Leaves when mature more or less hairy on the surface, with no stellate nor centrally fixed hairs.
 Cymes short, 3-1-flowered, approximated in the upper axils, so as to form a terminal, more or less interrupted spike.
 Species of West Africa.
 Dark green; posticous sepal quadrate-oblong . 59. *B. opaca*.
 Very villous; posticous sepal lanceolate . . 60. *B. villosa*.
 Species of East or East Central Africa.
 Posticous sepal quite entire.
 Yellow-green, strigose with tawny hairs . . 61. *B. ventricosa*.
 Dark green, mature leaves minutely hairy . 62. *B. Grantii*.
 Spikes strobiliform, softly grey-villous . . 63. *B. Limnogeton*.
 Posticous sepal minutely toothed 64. *B. vix-dentata*.
 Cymes not strobilate; many of the few-flowered cymes in distant axils, or on shortened lateral branches.
 Corolla (in total length) $1\frac{1}{6}$ –2 in.
 Species of West Africa.
 Flower-clusters axillary; bracts nearly glabrate 65. *B. ruellioides*.
 Flowers 3 or 4 subterminal; bracts softly hairy 66. *B. Antunesi*.
 Species of East Africa.
 Leaves tapering at the base.
 Leaves 4–6 in. long, subsessile.
 Leaves uniformly pale green beneath . 67. *B. Holstii*.
 Leaves strongly reticulated beneath . 68. *B. neurophylla*.
 Leaves seldom up to $1\frac{1}{2}$ –2 in. long, very shortly petioled.
 Posticous sepal $\frac{3}{4}$ in. long, ovate 69. *B. repens*.
 Posticous sepal 1 in. long, cordate 70. *B. querimbensis*.
 Posticous sepal $\frac{1}{2}$ in. long, ovate 71. *B. Boehmii*.
 Leaves rounded at the base, conspicuously petioled 72. *B. Volkensii*.
 Corolla (in total length) $\frac{2}{3}$ – $\frac{3}{4}$ in.
 Posticous sepal subentire.
 Leaves $1\frac{1}{2}$ in. long, villous; posticous sepal $\frac{1}{3}$ in. long. 73. *B. Stuhlmanni*.
 Leaves $\frac{1}{2}$ – $\frac{3}{4}$ in. long, villous; posticous sepal $\frac{1}{4}$ – $\frac{1}{3}$ in. long 75. *B. usambarica*.
 Leaves $1\frac{1}{4}$ in. long, strigose; posticous sepal nearly $\frac{1}{2}$ in., rounded 76. *B. rotundisepala*.
 Posticous sepal toothed 74. *B. micrantha*.

1. **B. Prionitis**, Linn. *Sp. Plant.* 636. Glabrous or slightly hairy. Stems 1–3 ft. high. Leaves up to 7 by 2 in. (commonly $3\frac{1}{2}$ by 1 in.), elliptic, narrowed at both ends, entire, full of cystoliths; petiole 0– $\frac{1}{3}$ in. long; young and floral-leaves narrowed at the base,

glabrous or with a few simple stiff erect white or fuscous hairs. Interpetiolar spines $\frac{1}{4}$ – $\frac{3}{4}$ in. long, rigid, acicular, simple, 2 opposite or often 3 or 4 (1 or 2 of the succeeding pair developed); bracts next the calyx similar to the spines, terete or somewhat trigonous at the base. Inflorescence reduced nearly to a simple spike, short or long, frequently with solitary flowers in the lower distant axils, but sometimes with 2-flowered racemes. Posticous sepal $\frac{1}{2}$ in. long, elliptic-lanceolate, acuminate, usually mucronate, glabrous or nearly so, erect in fruit; anticous segment sometimes quite entire (not distinctly 2-nerved), sometimes with 2 lanceolate mucronate teeth one-sixth the length of the segment. Corolla yellow, 2-lipped; tube (cylindric part) hardly $\frac{1}{2}$ in. long; posticous lip of 4 connate segments $\frac{2}{3}$ –1 in. long; anticous segment clawed, shorter. Filaments glabrous; pollen globose, honeycombed. Capsule $\frac{1}{2}$ – $\frac{2}{3}$ in. long, ovoid-conic, beaked, 2-seeded.—Nees in DC. Prod. xi. 237; T. Anders. in Journ. Linn. Soc. vii. 28 (only as to non-African plants); S. Moore in Journ. Bot. 1880, 265; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 482; Lindau in Engl. Jahrb. xviii. 63, t. 1, fig. 29, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 314, fig. 105 C, fig. 106 B, fig. 125 E, and in Engl. Pfl. Ost-Afr. C. 369 partly. *B. Hystrix*, Linn. Mant. 89, not of A. Rich. *B. prionitoides*, Engl. in Engl. Jahrb. x. 262; Rumph. Herb. Amb. vii. 22, t. 13.

Nile Land. British East Africa: Ribe to Galla country, *Wakefield!* Tana River, *Thomas*, 16!

Lower Guinea. Angola: Loanda, *Welwitsch*, 5067! 5138! 5190! Ambriz, *Welwitsch*, 5141! *Monteiro!* Hereroland: Karribib, 3200 ft., *Marloth*, 1430!

Mozamb. Dist. British Central Africa: Nyasaland; Blantyre, *Buchanan!*

Also in Tropical Asia.

This plant is much cultivated, and spreads as a weed; the flowers vary from orange-yellow to cream-colour. The form called *B. prionitoides* differs by its long simple spikes, and is common in India. As to the synonymy, *B. Hystrix*, Linn., is founded wholly on Rumph. Herb. Amb. vii. t. 13, a Malayan plant which can be no other than *B. Prionitis*, Linn., under which, moreover, the identical plate of Rumphius is quoted. The type example of *B. Hystrix* in Linnæus' own herbarium is exactly *B. prionitoides*, Engl.

2. ***B. proxima***, *Lindau in Ann. Istit. Bot. Roma* vi. [1896] 72. Leaves oblong, 1 by $\frac{1}{4}$ in., sparsely hairy. Interpetiolar spines $\frac{1}{3}$ in. long; often 3 or 4. Filaments of fertile stamens minutely hairy. Ovary minutely hairy; otherwise as *B. Prionitis*.

Nile Land. Somaliland: Ogaden Desert, *Riva*, 253, 299, 344, 366!

3. ***B. diacantha***, *Nees in DC. Prod.* xi. 238 partly. Interpetiolar spines up to $\frac{3}{4}$ –1 in. long, often paired. Floral leaves obovate-lanceolate, spine-tipped, rigid. Posticous sepal $\frac{1}{3}$ in. long, ovate, acuminate or spine-tipped; otherwise as *B. Prionitis*.—A. Rich. Tent. Fl. Abyss. ii. 144, not of Solms-Laub. *B. Prionitis*, T. Anders. in Journ. Linn. Soc. vii. 28 mainly. *B. Marghilomanæ*, Schweinf. et Volk. Liste Pl. d. Somalis, 16, and in Ghika, Pays des Somalis, 216.

Nile Land. Eritrea: Arrot Valley, 4300 ft., *Schweinfurth & Riva*, 1407! Selet Valley, 5500 ft., *Schweinfurth & Riva*, 1666! Abyssinia, *Schimper*, 682! 1922! *Quartin-Dillon & Petit*, 287!

Mozamb. Dist. German East Africa: Usambara; Muoa, *Holst*, 3213! Usaramo; Dar-es-Salaam, *Stuhlmann*, 8530!

4. ***B. induta***, *C. B. Clarke*. Densely shortly villous or fuscous-tomentose. Stems 4–5 ft. high, stout. Leaves $1\frac{1}{2}$ by $\frac{1}{2}$ in., elliptic, narrowed at both ends, subsessile, thick, when mature glabrous above, without cystoliths, densely villous beneath. Spines and inflorescence as of *B. Prionitis*. Posticous sepal $\frac{1}{2}$ in. long, ovate-lanceolate, acute, entire, densely villous nearly to the mucronate tip, in fruit rigid, thick, recurved. Capsule $\frac{3}{4}$ in. long and upwards, rostrate, 2-seeded; otherwise as *B. Prionitis*.—*B. Prionitis*, Herb. Linn. partly, not of Linn. Sp. Plant. *B. Hystrix*, β . *oblongifolia*, Nees in DC. Prod. xi. 239. *B. bispinosa*, Hochst. ex Nees in DC. Prod. xi. 239; T. Anders. in Journ. Linn. Soc. vii. 27, not of Vahl. *B. diacantha*, Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 106, from description.

Nile Land. Eritrea: Bogos, 6000 ft., *Hildebrandt*, 450! Abyssinia: Adowa, *Schimper*, 208! and without precise locality, *Herb. Linnæus!* *Salt!* *Schimper*, 782!

B. bispinosa, Vahl, is an Arabian plant with pale-purple flowers. *B. induta* is very near *B. Prionitis* except as to the many hairs permanent on the leaves.

5. ***B. trispinosa***, *Vahl*, *Symb.* i. 46. Inflorescence in terminal strobilate short heads, 1–2 in. long; floral leaves $\frac{3}{4}$ by $\frac{1}{2}$ in., ovate from a rounded base, imbricate; otherwise nearly as *B. Prionitis*.—Nees in DC. Prod. xi. 238, excluding var. β , γ . *B. macracantha*, R. Br. in Salt, Abyss. Append. 64. *B. diacantha*, Nees in DC. Prod. xi. 238 partly; A. Rich. Tent. Fl. Abyss. ii. 144 partly. *B. Prionitis*, Engl. Hochgebirgssfl. Trop. Afr. 391 partly. *Justicia trispinosa*, Forsk. Fl. Ægypt.-Arab. 6.

Nile Land. Eritrea: Massowa, *Defters*, 1036! Keren, *Steudner*, 1504! Abyssinia: Samen; Jaja, 5000–6000 ft., *Schimper*, 14! near Adegunna, *Schimper*, 1008! Shoa, *Petit!* and without precise locality, *Salt!*

Interpetiolar spines 2 or 3 together, some short, some 1 in. long. The present plant is distributed by Schweinfurth and Barbey (specimens collected in Arabia Felix) as the true *B. trispinosa*, Vahl, and doubtless rightly, as Forskal in his original description says the flower was fulvous-yellow, 2-lipped, and the spikes strobilate.

6. ***B. senensis***, *Klotzsch in Peters, Reise Mossamb.* 209. Innovations densely yellow-strigose. Leaves $3\frac{1}{2}$ by 1 in., acuminate at each end, when mature glabrate with conspicuous cystoliths on both surfaces; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. long. Spines scarcely $\frac{1}{10}$ in. long. Heads scarcely $\frac{2}{3}$ in. long, subglobose; bracts closely overlapping, $\frac{1}{2}$ in. long, spathulate-obovate, obtuse, apiculate, yellow-strigose, then glabrate. Posticous sepal $\frac{1}{4}$ – $\frac{1}{3}$ in. long, elliptic, cuspidate. Corolla of *C. Prionitis*. Filaments glabrous.—Lindau in Engl. Pfl. Ost-Afr. C. 369.

Mozamb. Dist. Portuguese East Africa: Rios de Sena, *Peters!*

7. **B. Smithii**, *Rendle in Journ. Bot.* 1896, 396. Hairs few, simple, rigid, appressed, mainly on the margins of the leaves and nerves beneath. Leaves up to $1\frac{1}{3}$ by $\frac{1}{2}$ – $\frac{2}{3}$ in., obovate, obtuse, mucronate. Corolla blue (*Rendle*), total length 1 in. or more, strongly 2-lipped; tube $\frac{1}{2}$ in. long, narrow; anticous segment much shorter than the 4-lobed posticous segment.—*B. Pseudoprionitis*, Lindau in *Ann. Istit. Bot. Roma* vi. [1896] 73.

Nile Land. Somaliland: between Danna Torrent and Karanle River, *Riva*, 953! Ahl Mountains, 6300 ft., *Hildebrandt*, 857! and without precise locality, *Donaldson Smith*!

Lindau gives the flowers in *B. Pseudoprionitis* as reddish. The dried flowers of *B. Smithii* are (at least partly) blue.

8. **B. hereroensis**, *Engl. in Engl. Jahrb.* x. 261. Plant 3 ft. high, everywhere minutely hoary-pubescent. Leaves 1 by $\frac{1}{2}$ in., oblong, subacute; petiole $\frac{1}{8}$ in. long. Spikes terminal, loose; floral leaves spatulate, bracts (next the calyx) $\frac{1}{4}$ in. long, linear, recurved, rigid. Outer calyx-segments broad-elliptic, entire, 3–5-ribbed, densely yellow-glandular. Corolla deep blue, total length $1\frac{1}{4}$ in. Capsule $\frac{1}{2}$ in. long, oblong, hoary puberulous, 2-seeded.—*B. latiloba*, *Engl. in Engl. Jahrb.* x. 261.

Lower Guinea. German South-west Africa: Hereroland: near Daviep, 1600 ft., *Marloth*, 1460! near Otyimbingue, 2800 ft., *Marloth*, 1316!

9. **B. eranthemoides**, *R. Br. in Salt, Abyss. Append.* 64. Nearly glabrous. Corolla-tube 1 in. long, linear to the top, not slit on one side; limb of 5 patent subequal elliptic lobes $\frac{1}{3}$ – $\frac{1}{2}$ in. long, not at all 2-lipped; otherwise very like *B. Prionitis*. — *B. hypocrateriformis*, *Hochst. ex T. Anders. in Journ. Linn. Soc.* vii. 28. *B. Prionitis*, *T. Anders. in Journ. Linn. Soc.* vii. 28 partly. *B. Prionitis*, var. *setosa*, *Klotzsch in Peters, Reise Mossamb.* 209; *Solms-Laub. in Schweinf. Beitr. Fl. Aethiop.* 107, 243; *Lindau in Engl. Pfl. Ost-Afr. C.* 369.

Nile Land. Eritrea: Massowa, *Deflers*, 1179! Abyssinia: Samen; Jaja, 5000 ft., *Schimper*, 111! 2194! and without precise locality, *Salt! Schimper*, 759! 1685! Somaliland, *James & Thrupp! Mrs. Lort-Phillips! Miss Edith Cole!* British East Africa: Taita, *Hildebrandt*, 2388!

Mozamb. Dist. German East Africa: Kilimanjaro, *Smith!* Portuguese East Africa: Goa Island, *Peters!* British East Africa: Nyasaland, *Buchanan! Meller!*

The type plant of Salt has the anticous calyx-segment bifid at the top; the Goa plant has the corolla-tube thicker, the anticous calyx-segment bifid at the top; *Buchanan's* example is very like the Goa plant, but has the anticous calyx-segment entire, cuspidate, 1-spined.

10. **B. quadrispina**, *Lindau in Ann. Istit. Bot. Roma* vi. [1896] 72. Harsh and dense shrub, 6–8 in. in diam. Stem stout, densely and minutely hairy, with many small cystoliths. Leaves up to $1\frac{1}{2}$ by $\frac{1}{4}$ in., narrowly obovate, suddenly narrowed, mucronate; hairs simple, rigid, straight, ascending, fuscous or white; spines $\frac{1}{2}$ –1 in. long, very numerous, many compound as though 4-partite $\frac{1}{6}$ in. above the base—i.e. barren

shoots often with 2 pairs of decussate reduced leaves. Floral leaves linear, $\frac{2}{3}$ by $\frac{1}{20}$ in.; bracts $\frac{1}{2}$ in. long, subulate, not rigid. Calyx-segments $\frac{1}{10}$ in. in diam., ovate; posticous segment including the spinous tip $\frac{1}{4}$ in. long. Corolla 1 in. long, or rather more, yellow (?), 2-lipped; tube $\frac{1}{2}$ in. long; posticous lip of 4 segments connate for $\frac{1}{3}$ in. Capsule (immature) very small.—*B. setigera*, var. *pumila*, Rendle in Journ. Bot. 1896, 396. *B. linearifolia*, Rendle in Journ. Bot. 1896, 397.

Nile Land. Abyssinia: Ankober, *Roth*, 487! Somaliland: Turfa, *Donaldson Smith*! Harar, *Robecchi*, 10! Milmil, *Riva*!

11. ***B. setigera***, *Rendle in Journ. Bot.* 1896, 395, *exclud. var. β*. Nearly glabrous. Stems much-branched, 1–2 ft. high. Leaves up to $1\frac{1}{2}$ by $\frac{1}{2}$ in., subobtuse, mucronate; petiole hardly any; interpetiolar spines $\frac{1}{4}$ – $\frac{1}{2}$ in. long, straight, slender, often 4 together. Inflorescence mainly in loose terminal panicles 1– $3\frac{1}{2}$ in. long; lateral racemes developed, 1–2-flowered; sterile bracts 1 by $\frac{1}{20}$ in., almost foliaceous; fertile bracts $\frac{1}{2}$ – $\frac{3}{4}$ in. long, linear, flat, hardly spine-like. Calyx as of *B. Prionitis*. Corolla nearly 1 in. long, rather slender, narrowly funnel-shaped upwards, but slit down on one side.

Nile Land. Somaliland: Darar, *Donaldson Smith*!

Var. (?) *brevispina*, C. B. Clarke; leaves larger, up to 4 by $2\frac{1}{2}$ in., often acuminate; spines less than $\frac{1}{4}$ in. long, curved, deflexed, rather stout, red; corolla exceeding 1 in. long in R. Brown's example, sometimes $1\frac{1}{2}$ in. long.—*B. brevispina*, R. Br. in Salt, Abyss. Append. 64 (name only).

Nile Land. Abyssinia, *Salt*! British East Africa: Mombasa, *Hildebrandt*, 2002B!

Mozamb. Dist. German East Africa: Usaramo; Dar-es-Salaam, *Hildebrandt*, 1223! *Stuhlmann*, 471! *Kirk*, 12! Usambara; Pangani, *Volkens*, 482!

12. ***B. waggana***, *Rendle in Journ. Bot.* 1897, 377. Long-hairy, very woody, branched undershrub. Leaves 1 by $\frac{1}{2}$ in., elliptic, obtuse, narrowed to the base, hairy, soft; interpetiolar spines $\frac{1}{4}$ – $\frac{2}{3}$ in. long, needle-like, white, glabrous, 2 or 4 together. Inflorescences in terminal dense heads 1– $1\frac{1}{2}$ in. long; sterile and fertile bracts very numerous, $\frac{3}{4}$ –1 by $\frac{1}{20}$ in., flat, green, soft with long white simple hairs, so that the heads appear feathered. Calyx $\frac{1}{2}$ – $\frac{2}{3}$ in. long; segments 4, consisting of a lamina hardly $\frac{1}{8}$ in. in diam., terminating in a plumose bristle. Corolla $\frac{2}{3}$ in. long. Capsule $\frac{1}{3}$ in. long, rostrate.

Nile Land. Somaliland: Golis Range and Waggar Mountains, *Mrs. Lort-Phillips*!

13. ***B. triacantha***, *Nees in DC. Prod.* xi. 240. Small harsh shrub; nodes of branches short, minutely and densely hairy. Leaves $\frac{1}{2}$ by $\frac{1}{4}$ in., obovate, subsessile, obtuse with a mucro, when young densely hairy, when mature with scattered hairs on the faces. Fertile bracts $\frac{1}{2}$ – $\frac{3}{4}$ in. long; spines, some simple, many with 1 or 2 lateral spines on each side; flowers all apparently solitary, axillary. Posticous calyx-segment $\frac{1}{2}$ – $\frac{2}{3}$

by $\frac{1}{5}$ in., ovate-lanceolate, spinous on margin; anticus calyx-segment subsimilar; two interior hardly half so long, not spinous. Ovary glabrous, enclosed more than half its length in the large cup-like disc, glandular-hairy at the tip. Capsule $\frac{1}{2}$ – $\frac{1}{3}$ in. long, narrow-ellipsoid, acute, 2-seeded.—A. Rich. Fl. Abyss. ii. 145; Zarb, Cat. Spéc. Bot. Pfund, 32. *B. acanthoides*, T. Anders. in Journ. Linn. Soc. vii. 27, not of Vahl.

Nile Land. Abyssinia: Adegunna, *Schimper*, 1004! Somaliland: Berbera, *Perry*!

Corolla said to be "pale-mauve to white" (*Perry*). This species is near *B. candida*, which has entire calyx-segments. The capsule is not half the size of that of *B. acanthoides*, the inflorescence and toothed calyx-segments are quite unlike, the capsule is only 2-seeded. But the species nevertheless appears on the whole more allied to *B. acanthoides* than to the subgenus *Prionitis*.

14. **B. grandicalyx**, *Lindau in Engl. Jahrb.* xx. 25. Branches up to 1 ft. long, hispid. Leaves up to 2 by 1 in., tip obtuse-triangular, base narrowed, with short white and long 1-celled tawny hairs; petiole $\frac{1}{8}$ in. long; interpetiolar spines $\frac{1}{3}$ in. long, simple, hairy, straight or curved near the top. Flowers solitary; bracts $\frac{1}{3}$ in. long, as simple spines, hairy. Posticous sepal $\frac{3}{4}$ by $\frac{1}{2}$ in., coarsely spinous-toothed in the upper half. Corolla oblique, hardly 2-lipped, pale blue; tube $\frac{3}{4}$ in. long, slightly widened upwards. Ovary glabrous, tip minutely hairy; ovules 2, subsimilar in each cell.

Nile Land. Bongo: Gir, *Schweinfurth*, 2512! 2572! Jur, *Schweinfurth*, 24.

Mozamb. Dist. German East Africa: Urundi; Ruvuvu River, 4000–5000 ft., *Scott-Elliott*, 8132!

Var. *vix-dentata*, C. B. Clarke. Leaves smaller, usually 1 in. long. Posticous sepal $\frac{1}{2}$ by $\frac{1}{5}$ in., hardly at all toothed. Corolla rather smaller, intense blue.—*B. Kirkii*, S. Moore in Journ. Bot. 1880, 265, not of T. Anders.

Nile Land. Mittu: at the River Rohl, *Schweinfurth*, 2846! Upper Nile, *Freeman & Lucas*, 88!

Lower Guinea. Angola: Huilla; Humpata, *Johnston*! Catumba, *Welwitsch*, 5048! and without precise locality, *Antunes*!

Mozamb. Dist. German East Africa: Kilimanjaro, *Smith*!

The differences between *B. grandicalyx* and its var. are greater than those between some species hereabout. This plant is very near, and has been regarded as equal to *B. Gueinzii*, Sonder, from Natal; which differs by having the leaves rounded at the base. In the Angolan example, the two interior sepals are $\frac{2}{3}$ the length of the outer, lanceolate-linear.

15. **B. mucronata**, *Lindau in Engl. Jahrb.* xx. 24. Leaves up to $1\frac{1}{3}$ by $\frac{1}{2}$ in. Posticous sepal $\frac{3}{4}$ by $\frac{1}{2}$ in., strongly spine-toothed. Capsule $\frac{3}{4}$ in. long, 4-seeded; otherwise as *B. grandicalyx*.—*Lindau in Engl. Pfl. Ost-Afr. C.* 369. *B. kilimandscharica*, *Lindau in Engl. Jahrb.* xx. 26, in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 315, and in *Eng. Pfl. Ost-Afr. C.* 369.

Mozamb. Dist. German East Africa: Kilimanjaro, 3500 ft., *Volkens*, 1613! 1753A! 2141! 2142! 7000 ft., *Meyer*, 57! Usambara; Nyika Steppe, *Holst*, 3916! Mascheua, *Holst*, 8853!

B. mucronata, *Lindau*, has grey hairs, and *B. kilimandscharica* tawny; *B. grandicalyx*

calyx has much larger leaves with curved primary nerves, otherwise I see little difference. Lindau contrasts *B. mucronata* with *B. Kirkii* (by which he means *B. spinulosa*); this differs a good deal by the sterile bracts being nearly reduced to pinnatifid spines, and the inflorescences having (very many of them) several flowers.

16. ***B. ramulosa***, *C. B. Clarke*. Stem soft, with spreading and deflexed hairs; branches many; nodes very many, short. Leaves $\frac{1}{3}$ – $\frac{1}{2}$ in. long, sessile, elliptic, somewhat obovate, obtuse, mucronate, hairy on both faces with small white crispate hairs and scattered long brown needle-like 1-celled hairs; interpetiolar spines $\frac{1}{3}$ in. long, simple, straight or slightly recurved, more or less hairy. Flowers solitary (rarely 2); bracts $\frac{1}{3}$ in. long, reduced to simple spines, hairy, slightly recurved. Posticous sepal $\frac{1}{2}$ by $\frac{1}{4}$ in., with many spinous teeth on the margin, hairy; interior sepals $\frac{1}{4}$ in. long, oblong-linear. Ovary glabrous, style nearly $\frac{2}{3}$ in. long. Capsule less than $\frac{1}{3}$ in. long, 4-seeded.

Nile Land. British East Africa: 2500 ft., *Scott-Elliot*, 6312! *Duruma*, *Hildebrandt*, 2339!

Resembles much *B. buxifolia*, Linn., which has a capsule $\frac{3}{4}$ in. long.

17. ***B. nyasensis***, *C. B. Clarke*. Branches closely hairy with erect hairs. Leaves $\frac{1}{2}$ by $\frac{1}{4}$ in., sessile, elliptic, almost acute, mucronate, with many short white hairs and some long 1-celled tawny hairs; interpetiolar spines $\frac{1}{3}$ in. long, simple, hairy, somewhat recurved. Flowers solitary; bracts $\frac{1}{3}$ in. long, simple, hairy, recurved. Posticous sepal $\frac{3}{4}$ –1 by $\frac{1}{2}$ – $\frac{2}{3}$ in., quadrate-ovate, veined, sparsely hairy, with many triangular-mucronate teeth. Corolla exceeding $1\frac{1}{2}$ in. in length, blue; tube more than 1 in. long, linear-cylindric, slightly wider upwards.

Mozamb. Dist. Portuguese East Africa: Mountains east of Lake Nyasa, *Johnson*!

This hardly differs from *B. mysorensis*, Roth, which has, however, the corolla usually smaller. It is not unlikely that the mature plant of *B. nyasensis* produces sometimes much larger leaves than those seen.

18. ***B. buxifolia***, *Linn. Sp. Plant. ed. ii.* 887. Branches with lax spreading hairs. Leaves $\frac{1}{3}$ – $\frac{2}{3}$ in. long, ovate or obovate, subobtuse, mucronate, nearly sessile; hairs on both faces scattered, white, short, crispate, also some long, tawny, needle-like, 1-celled; inter-petiolar spines $\frac{1}{4}$ – $\frac{1}{3}$ in. long, simple, straight, glabrous. Flowers mostly solitary; bracts $\frac{1}{4}$ – $\frac{1}{3}$ in. long, reduced to simple spines. Posticous sepal $\frac{1}{2}$ by $\frac{1}{4}$ in. (in the African specimen), broadly oblong, apiculate, veined, hairy, hardly toothed. Corolla-tube (in Indian examples) $\frac{3}{4}$ –1 in. long, slightly widened upwards, limb purple-blue. Capsule (in African example) $\frac{3}{4}$ in. long, 4-seeded.—*Nees* in *DC. Prod.* xi. 241; *Wight*, *l.c.* t. 870; *C. B. Clarke* in *Hook. f. Fl. Brit. Ind.* iv. 483. *B. acanthoides*, *Oliv.* in *Trans. Linn. Soc.* xxix. 127, not of *Vahl*. *Barleria*, sp. 1, *T. Thoms.* in *Speke, Nile Append.* 643. *Dicranacanthus buxifolia*, *Ørsted* in *Vidensk. Meddel. Kjob.* 1854, 136.—*Rheede*, *Hort. Mal.* ii. 91, t. 47.

Mozamb. Dist. Without locality, collected in 1860, *Speke & Grant!*

Also extends to India.

The branchlet, which is the African material for this species, has no flower, but there is a ripe capsule. It is either *B. buxifolia* or excessively near thereto. The small simple shining-brown acicular spines show that it certainly is not near *B. acanthoides*.

19. **B. crassa**, *C. B. Clarke*. Branches closely hairy with erect hairs. Leaves up to 1 by $\frac{1}{2}$ in., thick, densely hairy. Posticous calyx-segment hairy, slightly toothed; otherwise as *B. ramulosa*.

Mozamb. Dist. ? South African Goldfields, *Baines!*

The peculiar 2-fold indumentum of the leaves is exactly as that of *B. ramulosa*, of which this might be a dry-country form.

20. **B. longissima**, *Lindau in Ann. Istit. Bot. Roma vi.* [1896] 73. Glandular-villous. Leaves $\frac{3}{4}$ by $\frac{1}{3}$ in., glandular-hairy on both faces; interpetiolar spines $\frac{3}{4}$ in. long, straight, glandular hairy. Posticous sepal 1– $1\frac{1}{4}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., broad-lanceolate, purple-veined, subentire, hairy. Corolla blue or white; tube 4 in. long. Capsule 1 in. long, 4-seeded, glabrous.

Nile Land. Somaliland: near Coromma, *Riva*, 640!

21. **B. blepharoides**, *Lindau in Engl. Jahrb. xx.* 24. Branches long-pubescent. Leaves up to 1 by $\frac{1}{2}$ in., densely hairy on both surfaces. Inflorescences unilateral, of several flowers; bracts and bracteoles reduced to simple spines, $\frac{1}{2}$ – $\frac{3}{4}$ in. long, straight, stout. Posticous sepal up to 1 by $\frac{2}{3}$ in., ovate, spinous-toothed, finely reticulated, coloured. Corolla-tube $\frac{2}{3}$ in. long.—*Lindau in Engl. & Prantl, Pflanzenfam. iv.* 3 B. 315, and in *Engl. Pfl. Ost-Afr. C.* 369.

Mozamb. Dist. German East Africa: Unyamwezi, *Stuhlmann*, 496!

22. **B. Marlothii**, *Engl. in Engl. Jahrb. x.* 262. Small shrub; branches densely canescent with minute simple white hairs, and with subsessile yellow glands, many-striate; internodes $\frac{1}{2}$ – $1\frac{1}{2}$ in. long. Leaves $1\frac{1}{3}$ by $\frac{1}{4}$ in., broadly oblong, obtuse, tapering at the base, minutely hairy. Racemes unilateral, condensed, several-flowered (in *Welwitsch's* examples 2–1-flowered); sterile bracts $\frac{1}{4}$ in. long, spine-tipped, recurved, base lanceolate green canescent; fertile bracts $\frac{1}{3}$ in. long, oblong, falcate, toothed or subentire. Posticous sepal up to $\frac{2}{3}$ by $\frac{1}{4}$ in., lanceolate, margin sometimes spine-toothed, sometimes with one or no tooth, canescent, and with many subsessile yellow glands. Corolla-tube $\frac{3}{4}$ in. long, hardly dilated at the top. Capsule $\frac{1}{3}$ – $\frac{1}{2}$ in. long, perfecting 4 seeds. *Barleria*, sp. nova *B. acanthoidi*, *Vahl*, affinis, *S. Moore in Journ. Bot.* 1880, 270.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 5013! 5024! Chella Mountains, *Johnston!* German South-west Africa: Hereroland; Otyimbingue, *Schinz*, 11! *Marloth*, 1315!

23. **B. acanthoides**, *Vahl, Symb.* i. 47. Harsh prickly branched undershrub; branches densely canescent. Leaves 1–2 in. long, oblong-elliptic, obtuse, mucronate, hairy, narrowed at the base, petiole $0-\frac{1}{4}$ in. long; interpetiolar spines simple 2–4 together, or compound. Racemes 1–8-flowered, condensed, unilateral, scorpioid; bracts appearing as flattened toothed more or less leaf-like or pinnatifid spines. Posticous sepal $\frac{2}{3}$ by $\frac{1}{2}$ in., ovate, veined, sparsely hairy, entire or ciliate, hardly toothed; lateral sepals less than $\frac{1}{2}$ as long, linear-oblong. Corolla white; tube often 3 in. long and upwards, cylindrical, funnel-shaped only just at the top; lobes $\frac{1}{3}$ in. long. Capsule $\frac{1}{2}$ in. long, 4-seeded.—Nees in DC. Prod. xi. 240; A. Rich. Tent. Fl. Abyss. ii. 145; T. Anders. in Journ. Linn Soc. vii. 27 in small part; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 105, 242, exclud. syn. R. Br.; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 484; Boiss. Fl. Orient. iv. 524; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 314, in Engl. Pfl. Ost-Afr. C. 369, and in Ann. Istit. Bot. Roma vi. [1896] 71. *Wahabia longiflora*, Fenzl ex Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 105.

Nile Land. Nubia: Coast-land, 3000–4000 ft., *Bent!* Suakin, *Schweinfurth*, 276! Dulac Archipelago, *Steudner*, 1507! Kordofan, *Kotschy*, 58! 73! *Pfund*, 221! 318! Dardar, *Pfund*, 425! 426! 439! Eritrea: near Mount Yangous, 1100 ft., *Schweinfurth & Riva*, 599! Habab, 3000 ft., *Hildebrandt*, 451! Massowa, *Lord!* Abyssinia: Gageros, 3500–5000 ft., *Schimper*, 128! Tacazze River, *Schimper*, 1856! Somaliland: Ogaden, *Robecchi*, 241!

Mozamb. Dist. German East Africa, *Fischer*, 183!

24. **B. Kirkii**, *T. Anders. in Journ. Linn. Soc.* vii. 30. Branch stout, glabrous, white; branchlets densely hairy with spreading clustered almost stellate hairs and with numerous gland-tipped hairs. Leaves $\frac{1}{2}$ –1 by $\frac{1}{4}$ – $\frac{1}{3}$ in., elliptic, triangularly narrowed at both ends, densely tomentose with white stellate hairs (more or less disappearing in age) and with few gland-tipped hairs, also with simple long 1-celled tawny acicular hairs, especially on the nerves; petiole $0-\frac{1}{20}$ in. long. Racemes 2–1-flowered; bracts (sterile and fertile) $\frac{1}{4}$ – $\frac{1}{3}$ in. long, spines apparently subulate, simple, but minutely toothed, hairy. Posticous and anticous calyx-segments subequal, $\frac{1}{2}$ by $\frac{1}{6}$ in., oblong, spine-toothed, becoming scarious reticulate-veined before the fruit is ripe. Style $\frac{3}{4}$ in. long. Capsule $\frac{1}{2}$ in. long, 4-seeded.

Mozamb. Dist. Portuguese East Africa: Kaurabassa Rapids, 30 miles above Tete, *Kirk!*

This is not the *B. Kirkii* of authors, who understand thereby the next species, *B. spinulosa*, Klotzsch.

25. **B. spinulosa**, *Klotzsch in Peters, Reise Mossamb.* 208. Branches with some spreading clustered hairs and many gland-tipped hairs, hardly glabrescent in age. Leaves up to $3\frac{1}{2}$ by $1\frac{1}{4}$ in., elliptic, narrowed at both ends, stellately tomentose when young, becoming more or less glabrate when mature, and then showing no cystoliths under a microscope; gland-tipped hairs few, simple straight tawny hairs many; petiole $\frac{1}{2}$ – $\frac{1}{3}$ in. long. Racemes 1–4-flowered (in *Buchanan*, 1028, stout,

8-flowered); bracts (sterile and fertile) $\frac{1}{3}$ – $\frac{2}{3}$ in. long, linear or lanceolate, green, spine-toothed (in *Buchanan*, 1028, longer, stouter). Posticous and anticous calyx-segments subequal, $\frac{2}{3}$ by $\frac{1}{2}$ in., ovate, spine-toothed, reticulately veined (but sometimes, *B. squarrosa*, Klotzsch, scarcely $\frac{1}{4}$ in. wide, oblong). Corolla pale purple-blue; tube $\frac{2}{3}$ in. long, cylindric to the top; lobes $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Capsule $\frac{1}{2}$ in. long, 4-seeded.—Lindau in Engl. Pfl. Ost-Afr. C. 369. *B. squarrosa*, Klotzsch in Peters, Reise Mossamb. 207; Lindau in Engl. Pfl. Ost-Afr. C. 369.

Mozamb. Dist. Portuguese East Africa: Kerimba Islands, *Peters!* Lower Zambesi; below Shigogo, *Kirk!* between Tete and Lupata, *Kirk!* Zambesi, *Kirk!* Tete, *Peters!* Lower valley of the River Shire, *Meller!* British Central Africa: Nyasaland; by the River Shire, *Kirk!* *Meller!* between Mpata and the Tanganyika Plateau, 2000–3000 ft., *Whyte!* Songwe and Karonga, 1700–2000 ft., *Whyte*, 29! Lake Nyasa; Lukoma (Likoma Islands?), *Bellingham!* Nyasaland, *Buchanan*, 173! 1028! 1313!

26. **B. Clivorum**, *C. B. Clarke*. Innovations, and young leaves beneath, stellate-tomentose. Leaves up to $4\frac{1}{2}$ by $1\frac{1}{2}$ in., acuminate at either end, when mature glabrous beneath with conspicuous cystoliths; petiole up to $1\frac{1}{4}$ in. long; otherwise as *B. spinulosa*.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; Shupanga, *Kirk!* British Central Africa: Nyasaland; between Mpata and the Tanganyika Plateau, 2000–3000 ft., *Whyte!*

27. **B. consanguinea**, *Klotzsch in Peters, Reise Mossamb.* 208. Branches thickly clothed with spreading white soft hairs $\frac{1}{10}$ in. long, without any gland-tipped hairs. Leaves 2– $1\frac{1}{4}$ in. long; otherwise as *B. spinulosa*.—Lindau in Engl. Pfl. Ost-Afr. C. 369.

Mozamb. Dist. Portuguese East Africa: Beira, *Braga*, 81! Lower Zambesi; Rios de Sena, *Peters!* Shupanga, *Scott!*

28. **B. capitata**, *Klotzsch in Peters, Reise Mossamb.* 210. Branch canescent with short incurved white hair. Leaves 1 by $\frac{1}{3}$ – $\frac{1}{2}$ in., sub-obtuse, narrowed at the base, subsessile, simply hairy. Inflorescence a unilateral, very dense, many-flowered raceme 1– $1\frac{1}{2}$ in. in diam.; sterile bracts $\frac{1}{4}$ – $\frac{1}{2}$ in. long, reduced to deeply pinnatifid stiff spines; fertile bracts 1 in. long, lanceolate, ciliate subspine-toothed. Posticous sepal $1\frac{1}{2}$ in. long, ovate-lanceolate, ciliate spine-toothed. Style $2\frac{1}{2}$ in. long. Capsule $\frac{2}{3}$ in. long, 4-seeded, glabrous.—Lindau in Engl. Pfl. Ost-Afr. C. 369.

Nile Land. Eritrea: *Schweinfurth*, 1071!

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; Rios de Sena, *Peters!* British Central Africa: Rhodesia; Leshumo Valley, *Holub!*

Allied to *B. lichtensteiniana* of South Africa.

29. **B. Steudneri**, *C. B. Clarke*. Small branched shrub, with simple hairs all over. Leaves up to 1 by $\frac{1}{3}$ in., obovate-elliptic, tip mucronate, base narrowed into a petiole $\frac{1}{8}$ in. long. Spikes dense, $1\frac{1}{2}$

in. in diam.; sterile bracts $\frac{1}{3}$ in. long, altogether spinous pinnatifid; outer fertile bracts up to 1 by $\frac{2}{3}$ in., ovate, acute, with many innocuous teeth. Calyx $\frac{2}{3}$ in. long; posticous segment obovate-oblong, shaggy. Corolla dark blue, more than 1 in. long.

Nile Land. Eritrea: Keren, *Steudner*, 1508!

30. ***B. mucronifolia***, *Lindau in Ann. Istit. Bot. Roma* vi. [1896] 71. Branch woody, hairy. Leaves $\frac{1}{2}$ by $\frac{1}{4}$ in., triangular at either end, hairy on both surfaces, tip with a hard spine $\frac{1}{16}$ in. long. Spikes $1\frac{3}{4}$ by $1\frac{1}{4}$ in., unilateral; sterile bracts 1 in. long, reduced to pinnatifid spines; empty bracts to spike 1 in. long, lanceolate, spinous. Posticous sepal 1 by $\frac{1}{3}$ – $\frac{1}{2}$ in., ovate, acute, spinescent, hairy. Corolla purple-blue, tube $1\frac{3}{4}$ in. long inflated near the top.

Nile Land. Somaliland: Gonene, *Riva*, 1098!

31. ***B. homoiotricha***, *C. B. Clarke*. Canescent with many short incurved white simple hairs. Leaves $\frac{3}{4}$ by $\frac{1}{2}$ in., obovate-elliptic, tip obtuse with a mucro, base narrowed; petiole 0 – $\frac{1}{5}$ in. long. Sterile bracts up to $\frac{1}{2}$ in. long, reduced to compound pinnatifid rigid spines; raceme many-flowered, unilateral, dense; fertile bracts $\frac{2}{3}$ in. long, elliptic-lanceolate, few-toothed. Posticous sepal $\frac{3}{4}$ by $\frac{1}{3}$ in., acute, margin spine-toothed; anticous calyx-segment hardly $\frac{1}{2}$ in. long, ovate, obtuse, entire or nearly so. Corolla-tube $1\frac{1}{4}$ in. long, funnel-shaped at the top. Filaments with scattered short white hairs nearly to the top. Ovary glabrous; ovules 2, subsimilar in each cell; style glabrous, with a very few microscopic hairs near the base.

Nile Land. Somaliland, *Miss Edith Cole! Gillet & Aylmer!*

This is allied to *B. mucronifolia*, Lindau, but has short uncurved grey (instead of villous) hairs, and smaller flowers.

32. ***B. elegans***, *S. Moore in Journ. Bot.* 1880, 269, *excluding syn.* Hairs simple or obscurely clustered. Branches 2 ft. long. Leaves up to $3\frac{1}{2}$ by $1\frac{1}{3}$ in., quite entire, narrowed into a petiole 0 – $\frac{1}{3}$ in. long. Racemes unilateral, 1 – $1\frac{1}{2}$ in. long, 2–8-flowered; fertile bracts $\frac{1}{2}$ by $\frac{1}{3}$ in., spine-toothed. Posticous sepal $\frac{1}{2}$ in. long, elliptic, acute, spine-toothed. Corolla blue-mauve; tube $\frac{1}{2}$ – $\frac{2}{3}$ in. long, narrowly funnel-shaped; lobes $\frac{1}{3}$ in. long. Capsule $\frac{1}{2}$ in. long, 4-seeded.—*B. pungens*, var. *macrophylla*, Nees in DC. Prod. xi. 237, not of Linn.

Lower Guinea. Loango, *Soyaux*, 26! Angola, *Welwitsch*, 5034! 5068! 5114! 5122! 5187! Ambriz, *Monteiro!* Huilla; Humpata, *Johnston!*

Also in South Africa.

In this plant the cystoliths are sometimes conspicuous in the leaves, sometimes altogether obscure. It is not easy to understand how Nees supposed it could be a var. of the Cape *B. pungens*, Linn., which has small toothed leaves with a different indumentum, and bears no superficial resemblance to *B. elegans*.

33. ***B. carruthersiana***, *S. Moore in Journ. Bot.* 1880, 270. Strigose; internodes $3\frac{1}{2}$ in. long, or only $1\frac{1}{2}$ in. long. Leaves up to $6\frac{1}{2}$

by $2\frac{3}{4}$ in. (often much smaller), narrowed into a petiole $\frac{1}{8}$ in. long. Racemes $1-1\frac{1}{2}$ in. long, unilateral; fertile bracts $\frac{1}{2}-\frac{2}{3}$ in. long, elliptic-lanceolate, margin toothed (in the sterile bracts doubly toothed or sub-pinnatifid). Posticous sepal nearly $\frac{3}{4}$ in. long and broad, spine-toothed. Corolla blue; tube $\frac{3}{4}$ in. long, slightly widened upwards. Ovary with 2 subsimilar ovules in each cell.

Lower Guinea. Angola: Quitibe de Cima, *Welwitsch*, 5040! Chella Mountains, *Johnston*!

34. **B. flava**, *Jacq. Eclog.* 67, t. 46. Innovations and stem strigose with tawny hairs. Leaves 7 by 2 in., attenuated at both ends, when mature strigose mainly on the nerves beneath; petiole $0-\frac{1}{4}$ in. long. Spikes very dense, up to 12-20-flowered (those seen all terminal); fertile bracts $1-1\frac{1}{4}$ in. long, linear, spine-toothed. Posticous sepal $\frac{3}{4}$ by $\frac{1}{2}$ in., ovate, spine-toothed; anticous calyx-segment $\frac{1}{2}$ in. long, ovate, obscurely bifid at the tip, spine-toothed. Corolla yellow (when dry mauve-violet); tube $1\frac{1}{4}$ in. long, cylindric; lobes $\frac{2}{3}$ in. long. Stamens 4, 2 very rudimentary; anthers muticous. Ovary glabrous, with 2 ovules in each cell; style glabrous, branches 2, subequal, linear, short, approximated.—*Nees* in *DC. Prod.* xi. 224; *Bot. Mag.* t. 4113; *T. Anders.* in *Journ. Linn. Soc.* vii. 32; *Lindau* in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 314. *B. senegalensis*, *Nees* in *DC. Prod.* xi. 224; *Benth.* in *Hook. Niger Fl.* 480. *B. Afzelii*, *Lindau* in *Engl. Jahrb.* xxiv. 319. *Eranthemum flavum*, *Willd. Enum. Hort. Berol. Suppl.* 2.

Upper Guinea. Senegambia: Rio Nunoz, *Heudelot*, 644! and without precise locality, *Whitfield*! Sierra Leone: near Mofari, *Scott-Elliot*, 4423! and without precise locality, *Afzelius*!

Long cultivated in European gardens.

The above description is from *Scott-Elliot*, 4423, noted to have yellow flowers, which have become in drying mauve-purple, as stated by *Nees*. The descriptions of the old garden plant recede in various ways; the wild plant appears a typical *Barleria*; *Jacquin* figures the stamens as 4, fertile, equal; the anthers are said to be sometimes tailed, the stigmas abnormal, &c.

35. **B. argentea**, *Balf. f. in Proc. Roy. Soc. Edinb.* xii. 86. Small branched shrub without spines; young branches canescent with minute 1-celled strigillose hairs. Leaves 1 by $\frac{1}{6}-\frac{1}{5}$ in., oblong or narrowly elliptic, base narrowed, when young canescent, when mature glabrate on the faces with cystoliths, with medifixed hairs on the margin, subsessile or with a petiole $\frac{1}{16}$ in. long. Cymes 1-3-flowered, condensed, small, scattered; bract and calyx with many minute spreading white hairs and gland-tipped few- or 1-celled hairs; bract $\frac{1}{4}$ in. long, nearly linear. Posticous sepal $\frac{1}{4}$ in. long, linear from an oblong base; anticous calyx-segment $\frac{1}{4}$ in. long, oblong, narrowed to a ligulate minutely notched tip; 2 inner sepals $\frac{1}{5}$ in. long. Corolla-tube $\frac{1}{3}$ in. long, cylindric, slightly dilated at the top; limb $\frac{1}{3}$ in. long or rather more (whole corolla $\frac{5}{8}$ in. long, fide *Balfour*). Stamens anthers and pollen of typical *Barleria*; Ovary minutely hairy, style glabrous, stigmas exactly of *Barleria*; ovules 2 in each cell, lower minute (but visible microscopically in the

capsule). Capsule $\frac{1}{3}$ in. long, silky, 2-seeded, the linear-conic beak $\frac{1}{6}$ in. long, forming half the capsule, seeds altogether of the genus.—Balf. f. in Trans. Roy. Soc. Edin. xxxi. 214; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315. *B. schweinfurthiana*, Lindau in Engl. Jahrb. xx. 26, in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315, and in Engl. Pfl. Ost-Afr. C. 369. *B. diffusa*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315; Rendle in Journ. Bot. 1896, 398. *B. yemensis*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315. *B. jucunda*, Lindau in Ann. Istit. Bot. Roma vi. [1896] 75. *B. Phillipseæ*, Rendle in Journ. Bot. 1897, 378. *Somalia diffusa*, Oliv. in Hook. Ic. Pl. t. 1528, and in James, Unknown Horn. Afr. 321, t. 3; Schweinf. in Höhnel, Zum Rudolph-See und Stephanie-See, Sonderabdr. 1892, 6.

Nile Land. Somaliland, *James & Thrupp!* Darar, *Donaldson Smith!* Yafir, 6500 ft., *Hildebrandt*, 860c! German East Africa: Usambara; West of the Pare Range, 600–2500 ft., *Höhnel*, 6!

An example bearing the MS. name *Gossypiospermum*, *Schweinfurth*, 1977A, at Kew, contains the present plant and *Ruellia patula*, Jacq.

In *B. jucunda*, Lindau, the capsule is glabrous or very nearly so; the upper part of the young ovary is glandular and hairy.

36. **B. parviflora**, *R. Br. in Salt, Abyss. Append.* 65. Branches with closely adpressed white hairs. Leaves up to $1\frac{1}{4}$ by $\frac{3}{4}$ in., ovate-elliptic, obtuse, rounded at the base, sessile, when young with some medifixed hairs on the margin, when mature nearly glabrate. Cymes lax, 1–3-flowered; bract nearly $\frac{1}{3}$ in. long, broad-lanceolate. Two outer calyx-segments exceeding $\frac{1}{4}$ in. long, ovate, acute; posticous notched. Corolla (whole length) $\frac{2}{3}$ in., or scarcely more. Ovary with 2 ovules in each cell, lower minute. Capsule $\frac{1}{3}$ in. long, 2-seeded, pubescent, beaked.—T. Anders. in Journ. Linn. Soc. vii. 29; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315. *B. Harnierii*, Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 106, 242. *B. pauciflora*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315. *B. cordifolia*, Hochst. ex T. Anders. in Journ. Linn. Soc. vii. 29.

Nile Land. Nubia: Mount Erkowit, near Suakin, *Schweinfurth*, 255! Eritrea: Habab, 5000 ft., *Hildebrandt*, 453! Abyssinia: mountains near Gageros, 3500 ft., *Schimper*, 11! 2291! and without precise locality, *Schimper*, 1383! 1627! Somaliland, *Riva*, 1680!

37. **B. Hochstetteri**, *Nees in DC. Prod.* xi. 231. Hairs and habit as of *B. argentea*. Leaves up to $1\frac{2}{3}$ by $\frac{3}{4}$ in., elliptic, obtuse, narrowed into a petiole $\frac{1}{8}$ – $\frac{1}{5}$ in. long. Cymes few-flowered, lax; pedicel often $\frac{1}{4}$ in. long, that of a lateral flower sometimes with minute linear bracteoles. Two outer calyx-segments nearly $\frac{1}{2}$ by $\frac{1}{3}$ in. ovate, entire, subequal. Corolla-tube $\frac{1}{2}$ in. long, lobes $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Ovary with 2 ovules in each cell, lower minute. Capsule exceeding $\frac{1}{3}$ in. long, 2-seeded, minutely hairy, beaked.—Wight, Ic. t. 1528; T. Anders. in Journ. Linn. Soc. vii. 29; Zarb, Cat. Spéc. Bot. Pfund, 32; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 107, 243; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 483; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315, fig. 125

F.; Rendle in Journ. Bot. 1896, 395. *B. Rivaei*, Lindau in Ann. Istit. Bot. Roma vi. [1896] 74. *B. Pirottaei*, Lindau in Ann. Istit. Bot. Roma vi. [1896] 75. *Barlerites Hochstetteri*, Ørsted in Vidensk. Meddel. Kjob. 1854, 137.

Nile Land. Dalac Archipelago, *Steudner*, 1512! Eritrea: near Saati, *Schweinfurth & Riva*, 581! Nubia: between Suakin and Berber, *Schweinfurth*, 122! 426! Cordofan: Mount Arasch Cool, *Kotschy*, 159! and without precise locality, *Kotschy*, 119! 476! *Pfund*, 417! 426! Darfur, *Pfund*, 418! Abyssinia: Togodele, *Ehrenberg*! Somaliland: Okoti, *Donaldson Smith*! Danna Torrent, *Riva*, 819! Daa River, *Riva*, 1082!

B. aucheriana, Nees, united with this species by T. Anderson, l.c., has subsessile, narrower leaves, and may be *B. argentea*. Nees' example is a fragment.

Extends eastwards to Scinde.

38. **B. orbicularis**, *Hochst. ex T. Anders. in Journ. Linn. Soc. vii. 92.* Cymes dense, unilateral, or many reduced to 1 flower. Two outer calyx-segments $\frac{3}{4}$ in. long and broad, tip rounded, base conspicuously cordate; otherwise as *B. Hochstetteri*.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 315. *B. cardiocalyx*, Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 105, 242. *B. chlamydocalyx*, Lindau in Ann. Istit. Bot. Roma vi. [1896] 73.

Nile Land. Abyssinia: Mountains near Gageros, 3300 ft., *Schimper*, 129! 2189! and without precise locality, *Schimper*, 1270! 1630! Somaliland, *Riva*, 1464!

B. chlamydocalyx is said by Lindau to differ by having gland-tipped hairs; but there are gland-tipped hairs on the young branches of *Schimper*, 2189.

39. **B. glandulifera**, *Lindau in Engl. Jahrb. xx. 22.* Small much-branched shrub, in all parts puberulo-tomentose and glandular. Leaves $\frac{1}{5}$ by $\frac{1}{6}$ in., round-elliptic; petioles up to $\frac{1}{8}$ in. long. Flowers solitary, axillary; bracts nearly $\frac{1}{6}$ in. long, spathulate. Exterior calyx-segments $\frac{1}{5}$ in. long, oblong. Corolla-tube $\frac{1}{4}$ in. long; lobes $\frac{1}{4}$ in. long. Ovary hairy, 2-ovulate; style hairy towards the base. Capsule $\frac{2}{5}$ in. long, 2-seeded.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 314.

Nile Land. Somaliland: Ahl Mountains, 6300 ft., *Hildebrandt*, 860E!

The capsule is altogether that of sect. *Somalia*, but the hairs are spreading; I see no stellate or basifixed hairs.

40. **B. polyneura**, *S. Moore in Journ. Bot. 1880, 266.* Glabrous except two opposite lines of minute white hairs on the branches. Leaves $2\frac{1}{2}$ by $1\frac{1}{2}$ in., ovate, reticulate-nerved, subsessile. Flowers approximated in the upper axils; bract $\frac{2}{3}$ by $\frac{1}{10}$ in., linear-spathulate. Posticous sepal $1\frac{1}{4}$ by $\frac{3}{4}$ in., cordate-ovate, entire; anticous calyx-segment nearly 1 in. long, tip of two depressed-triangular teeth; two inner sepals $\frac{1}{2}$ in. long, glabrous. Corolla white; tube purplish (*S. Moore*), $\frac{3}{4}$ –1 in. long, funnel-shaped; lobes scarcely $\frac{1}{3}$ in. long. Capsule $\frac{1}{2}$ in. long, glabrous, 2-seeded, tip conic.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 314.

Lower Guinea. Angola; near Lake Ivantala, *Welwitsch*, 5029!

41. **B. violascens**, *S. Moore in Journ. Bot.* 1880, 265. Leaves $2\frac{1}{4}$ by $\frac{1}{2}$ in., lanceolate, narrowed at both ends, subsessile. Bract 1 by $\frac{1}{2}$ in., linear. Anticous calyx-segment $\frac{3}{4}$ in. long, bilobed $\frac{1}{4}$ – $\frac{1}{3}$ the way down. Ovary with 2 ovules in each cell, lower very much smaller; otherwise as *B. polyneura*.—Engl. Hochgebirgsfl. Trop. Afr. 391.

Lower Guinea. Angola: Huilla, 5000–5300 ft., *Welwitsch*, 5016! 5028! *Antunes*, 67!

42. **B. obtusisepala**, *C. B. Clarke*. Branches full of cystoliths, glabrous. Leaves up to $3\frac{3}{4}$ by $\frac{3}{4}$ –1 in., lanceolate, subsessile, reticulate-nerved, when young with small scattered hairs on the surface and a few yellow stiff hairs on the margin, when mature nearly glabrous. Flowers approximated in the upper axils; bract nearly 1 by $\frac{1}{6}$ in. Two outer calyx-segments similar, subequal, $\frac{3}{4}$ by $\frac{1}{3}$ in., quadrate-oblong, suddenly narrowed at the top, apiculate, minutely hairy and with a few yellow stiff hairs on margin; two inner calyx-segments $\frac{2}{3}$ in. long, glabrous, with stalked glands at the top. Ovary and style glabrous, ovules 2 in each cell, lower much smaller; disc very short.—*Barleria* sp. nova, *B. salicifolia* affinis, *S. Moore in Journ. Bot.* 1880, 270.

Lower Guinea. Angola, *Welwitsch*, 5162!

43. **B. Welwitschii**, *S. Moore in Journ. Bot.* 1880, 267. Root woody; branches 1 ft. long or more, minutely pubescent, as are the innovations. Leaves up to 4 by 1 in., oblanceolate, obtuse, attenuate at the base, subsessile, when mature minutely pubescent on the midrib beneath. Flowers approximated in the upper axils; bract $\frac{1}{3}$ – $\frac{1}{2}$ by $\frac{1}{10}$ – $\frac{1}{12}$ in., linear or slightly spatulate. Posticous sepal $\frac{3}{4}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., quadrate-oblong, tip short triangular, minutely pubescent; anticous calyx-segment nearly similar but 2-nerved and the tip minutely notched; two inner sepals $\frac{1}{4}$ in. long, very pubescent; whole calyx with gland-tipped several-celled hairs. Corolla cream colour; tube 1 in. long. Ovary glabrous.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 314.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5091!

44. **B. alata**, *S. Moore in Journ. Bot.* 1880, 266. Innovations pubescent, and with gland-tipped several-celled hairs, branches up to 15 in. long, "pruinose" to the naked eye, minutely and densely pubescent with very small white curved hairs. Leaves up to $5\frac{1}{2}$ by 2 in., when mature nearly glabrous with minute hairs on the nerves beneath, tip triangular-acute, base triangular-acuminate so that the petiole appears winged. Flowers solitary in remote axils, also approximated in the upper axils; bract $\frac{1}{3}$ – $\frac{1}{2}$ in. long, linear. Calyx pubescent and with gland-tipped several-celled hairs; posticous segment $\frac{2}{3}$ in. long, quadrate-oblong, tip depressed-triangular; anticous segment nearly similar, but 2-nerved with the tip minutely notched; two interior calyx-segments $\frac{1}{4}$ in. long. Corolla-tube 1 in. long, inflated nearly from the base; lobes $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Ovary glabrous, setulose at the tip;

ovules 2 in each cell; style glabrous. Capsule 2-seeded, tip conic.—
B. lancifolia, T. Anders. in Journ. Linn. Soc. vii. 28.

Lower Guinea. Angola: Pungo Andongo and Golungo Alto, *Welwitsch*, 5147! 5148! 5169! 5194! 5195!

T. Anderson says the stem of his *B. lancifolia* was pruinose; S. Moore says his *B. alata* differs chiefly by having the stem scarcely pruinose, but it has really the stem more than pruinose. As to the corolla-difference, when T. Anderson says his corolla was funnel-shaped with a very short tube, I suppose that he means that the cylindrical part of the tube was very short.

45. **B. cyanea**, *S. Moore in Journ. Bot.* 1880, 265. Shrub much branching; nodes slender, long, full of cystoliths, with two opposite lines of minute curved white hairs, soon glabrate. Leaves 1 by $\frac{1}{4}$ in., sessile, tip triangular, base narrowed, when mature with scattered hairs above or nearly glabrous. Flowers solitary; bract $\frac{1}{8}$ in. long, linear. Posticous sepal $\frac{1}{2}$ by $\frac{1}{6}$ – $\frac{1}{5}$ in., entire, elliptic, sub-acute, reticulate-nerved, minutely hairy; anticous calyx-segment nearly similar; 2 inner sepals $\frac{1}{4}$ in. long. Corolla intense blue (*S. Moore*); tube $\frac{3}{4}$ in. long, slender; limb as long as the tube.

Lower Guinea. Angola: Mossamedes, *Welwitsch*, 5002!

46. **B. calophylla**, *Lindau in Engl. Jahrb.* xx. 17. Glabrous except the 2 inner sepals; branches 15 in. long, from a woody root-stock. Leaves up to $3\frac{3}{4}$ by $1\frac{1}{4}$ in., oblong, scarcely acute, sessile, base narrowed, rounded or cordate; cystoliths obscure. Racemes 3–1-flowered, condensed in the upper axils, running into an oblong head; floral leaves as the stem-leaves, but smaller; bract $\frac{2}{3}$ in. long, linear-oblong. Posticous sepal $1\frac{2}{3}$ by $\frac{3}{4}$ in., ovate-elliptic, glabrous, scarcely acute; anticous calyx-segment similar but obscurely 2-nerved; 2 inner sepals 1 in. long, linear, minutely pubescent. Corolla white, rose-suffused (*Schweinfurth*); tube $1\frac{1}{2}$ in. long, slightly funnel-shaped at the top; lobes $1\frac{1}{4}$ in. long. Capsule $\frac{3}{4}$ in. long, stout, with 4 seeds.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 314. *B. Newtoni*, *Lindau in Engl. Jahrb.* xxii. 117.

Nile Land. British East Africa: Niamniam; Gumba, *Schweinfurth*, 3422! Bongo; Addai, *Schweinfurth*, 2182!

Lower Guinea. Angola: Lobango, *Newton*, 193!

Lindau says *B. Newtoni* differs in having the leaves cordate at the base, but so has *Schweinfurth*, 3422.

47. **B. calophylloides**, *Lindau in Engl. Jahrb.* xx. 17. Glabrous or most obscurely puberulous, except the 2 inner sepals. Leaves 4 by 2 in., elliptic, rounded at the base, subsessile. Outer calyx-segments 1 in. long, ovate-elliptic; anticous shallowly notched at the top. Corolla yellow (*Lindau*); tube $1\frac{1}{5}$ in. long; lobes $\frac{4}{5}$ in. long. Ovary with two ovules in each cell, lower very much smaller than upper.—*Lindau in Engl. Pfl. Ost-Afr.* C. 368.

Mozamb. Dist. German East Africa: between Lake Tanganyika and Lake

Rukwa, 6000 ft., *Nutt!* Unyamwezi; Gonda, *Boehm*, 164! Uzinja; Bukome, *Stuhlmann*, 3431! British Central Africa: Urungu; Fwambo, *Nutt!*

48. **B. grandis**, *Nees in DC. Prod.* xi. 233. Branched shrub, 2–3 ft. high; branches with cystoliths and a few gland-tipped several-celled hairs, soon glabrate. Leaves up to $5\frac{1}{2}$ by $1\frac{1}{2}$ – $2\frac{1}{4}$ in.; narrow-elliptic to ovate, subsessile, when mature glabrate, with cystoliths. Racemes nearly all reduced to 1 flower, some in the lower axils, but chiefly in the upper axils forming a quasi-terminal dense panicle; bracteoles $\frac{1}{2}$ – $\frac{3}{4}$ in. long, linear. Calyx densely short-hairy and glandular; posticous sepal $1\frac{1}{4}$ by $\frac{2}{3}$ in., broadly oblong, hardly acute; anticous calyx-segment nearly similar but 2-nerved, minutely 2-toothed. Corolla blue (*Nees*); tube $2\frac{1}{2}$ in. long, slightly widened upwards; lobes $1\frac{2}{3}$ in. long. Ovary covered to the base with subsessile glands; ovules 2 of equal size in each cell; style glabrous.—*A. Rich. Tent. Fl. Abyss.* ii. 143; *Solms-Laub. in Schweinf. Beitr. Fl. Aethiop.* 242; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 314, fig. 125 A–D. *B. grandiflora*, *R. Br. in Salt, Abyss. Append.* 64 (name only). *B. grandifolia*, *T. Anders. in Journ. Linn. Soc.* vii. 30; *Engl. Hochgebirgsfl. Trop. Afr.* 391. *Barlerianthus grandis*, *Ørsted in Vidensk. Meddel. Kjob.* 1854, 136.

Nile Land. Abyssinia: Tigre; Addi-Cubbo-Hazzin, *Schimper*, 498! Mount Sinai, near Adowa, *Schimper*, 702! Axum, *Steudner*, 1509! Shire, *Quartin-Dillon & Petit*, 283! and without precise locality, *Parkyns!*

49. **B. Mackenii**, *Hook. f. in Bot. Mag. t.* 5866.—Branches minutely and densely white-hairy, glabrescent. Leaves $2\frac{1}{4}$ by 1 in., narrowed at both ends, subsessile, minutely setulose on the nerves beneath or glabrate. Racemes mostly reduced to 1 flower, in distant axils and approximate at the ends of the branches; bract $\frac{3}{4}$ by $\frac{1}{2}$ in. Posticous sepal 1 by $\frac{1}{2}$ – $\frac{2}{3}$ in., hardly acute, densely pubescent with small white hairs and with yellow bristles on the nerves; anticous segments similar; 2 inner sepals $\frac{1}{2}$ in. long, linear. Corolla mauve; tube $\frac{3}{4}$ in. long; lobes $\frac{2}{3}$ – $\frac{3}{4}$ in. long. Ovary covered to the base with minute white hairs and short-stalked glands; ovules 2 in each cell, the lower very much smaller than the upper; style glabrous, or with a few hairs near the base.—*Gard. Chron.* 1871, 72, fig. 16; *S. Moore in Journ. Bot.* 1880, 266.

Lower Guinea. Amboland: Okasima-Ka-Namutenya, *Schinz*, 58!

Mozamb. Dist. German East Africa: Usagara, 650 ft., *Stuhlmann*, 8154; British Central Africa: Matabeleland, *Elliot*, Tati Goldfields, *McKen!* Goldfields, lat. 23° S., *Chapman & Baines!* Rhodesia; *Schneemann's Pan*, *Holub*, 917! 918! Ngamiland; Kwebe, *Lugard*, 124!

50. **B. marginata**, *Oliv. in Trans. Linn. Soc.* xxix. 127, t. 128. Rootstock woody; branches 1– $1\frac{1}{2}$ ft. long with 2 opposite lines of minute white curved hairs, glabrate. Leaves 3 by $\frac{1}{3}$ in., narrowed to the base, sessile, when mature nearly glabrate except for yellow simple bristles on the margins and midrib beneath. Flowers approximate in

the upper axils, apparently a short terminal head; bract and calyx pubescent and with some bristles; bract $\frac{1}{2}$ – $\frac{2}{3}$ in. long, linear-lanceolate, falcate. Posticous calyx-segment nearly $\frac{3}{4}$ in. long, elliptic-lanceolate, acutely cuspidate; anticous segment $\frac{1}{2}$ in. long, broadly lanceolate, acutely cuspidate, obscurely 2-nerved; 2 inner sepals nearly $\frac{1}{2}$ in. long, linear. Corolla-tube 1 in. long, linear, hardly dilated at the top; lobes $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Ovary glabrous; ovules 2 in each cell, lower much the smaller; style glabrous. Capsule $\frac{2}{3}$ in. long, 2-seeded, beak conic.—Lindau in Engl. Pfl. Ost-Afr. C. 368. *Barleria*, sp. n. 2, T. Thoms. in Speke, Nile Append. 643.

Mozamb. Dist. German East Africa: Usaramo; at Matamombo on the Kingane River, *Speke & Grant!*

51. **B. ukamensis**, *Lindau in Engl. Pfl. Ost-Afr. C. 368.* Branches hispidulous. Leaves up to 2 by 1 in., elliptic, triangular at either end, subsessile, when mature minutely hispidulous on the nerves beneath. Heads terminal, $1\frac{3}{4}$ by 1 in., rather dense, sparingly hispid; bracts $\frac{3}{4}$ by $\frac{1}{3}$ in., subobtuse. Posticous and anticous lobes of the calyx $\frac{4}{5}$ by $\frac{1}{2}$ in., subsimilar, subobtuse, hispidulous on the nerves. Corolla-tube $\frac{3}{5}$ in. long, lobes $\frac{3}{5}$ in. long. Ovary and style-base glandular hairy.

Mozamb. Dist. German East Africa; Usagara, 700 ft., *Stuhlmann, 8154!*

52. **B. Lugardii**, *C. B. Clarke.* Branches woody, 18 in. long; innovations minutely white-hispid. Leaves $1\frac{1}{3}$ by $\frac{1}{2}$ in., narrowed at each end, glabrous, somewhat glaucous; cystoliths conspicuous; petiole $\frac{1}{8}$ in. long. Flowers solitary, in opposite axils; bract $\frac{1}{2}$ in. long, linear. Posticous calyx-segment $\frac{2}{3}$ in. long, ovate, acutely cuspidate, glaucous, with a few scattered white bristles; anticous calyx-segment rather shorter with 2 short lanceolate teeth; inner calyx-segments $\frac{1}{5}$ in. long. Corolla white, total length scarcely $\frac{3}{4}$ in. Ovary densely short hairy in the upper half.

Mozamb. Dist. British Central Africa: Ngamiland; Kwebe, *Lugard, 128!*

This species is near *B. violascens*, but the leaves and flowers are much smaller, and the flowers are not all approximated in the upper axils.

53. **B. stellato-tomentosa**, *S. Moore in Journ. Bot. 1880, 268.* Plant clothed with stellate and simple yellow subpersistent hairs. Stems 15 in. long from a woody root. Leaves $2\frac{1}{2}$ by $\frac{1}{2}$ –2 in., varying on one stem from broad-elliptic to narrow-oblong. Inflorescence in very dense hard terminal heads; floral leaves imbricated, outer ovate, inner spathulate, $\frac{3}{4}$ in. long, thick, brown-red, shining, viscid stellate-hairy and yellow-bristly; bract $\frac{2}{3}$ by $\frac{1}{6}$ in., linear-spathulate. Posticous sepal $\frac{3}{4}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., spathulate-obtuse; anticous calyx-segment $\frac{3}{4}$ by $\frac{1}{3}$ in., broadly elliptic, 2-nerved, shortly 2-lobed; 2 inner sepals $\frac{2}{3}$ in. long, linear; whole calyx with stellate and yellow simple hairs, more or less wearing off. Corolla violet-blue (*S. Moore*); tube $\frac{3}{4}$ in. long, linear-cylindric, very slightly dilated at the top; lobes $\frac{1}{2}$ in. long.

Ovary with a very few scattered stellate white hairs; style glabrous with a dense cluster of short glands at the base.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5095! 5165!

54. **B. stelligera**, *Lindau in Ann. Istit. Bot. Roma* vi. [1896] 71. Shrubby, with stellate and some long white simple hairs. Leaves 1 by $\frac{1}{4}$ in., oblong-elliptic, obtuse, base tapering; petiole hardly any. Heads $\frac{3}{4}$ in. long, terminal, very dense. Bracts $\frac{2}{3}$ in. long, ovate. Sepals nearly $\frac{1}{2}$ in. long, margins with many white simple hairs $\frac{1}{8}$ in. long, which protrude prominently from the dense heads. Corolla $\frac{3}{4}$ in. long. Otherwise resembling *S. salicifolia*.

Nile Land. Somaliland: Jellago, *Riva*, 1439!

55. **B. albostellata**, *C. B. Clarke*. Persistently white stellate-tomentose. Leaves up to $3\frac{1}{2}$ by $2\frac{1}{4}$ in., ovate, subacute; petiole up to $\frac{1}{3}$ in. long. Inflorescence in dense globose terminal heads 2 in. in diam.; floral leaves up to $1\frac{1}{3}$ by $\frac{3}{4}$ in., not viscid, ultimately papery; bract and calyx ultimately papery, with long white hairs and a few stellate hairs; bract 1 by $\frac{1}{6}$ in., ligulate, falcate. Posticous sepal $\frac{2}{3}$ in. long; anticous calyx-segment 1 in. long, tip notched; 2 inner sepals scarcely $\frac{1}{3}$ in. long. Capsule nearly $\frac{2}{3}$ by $\frac{1}{3}$ in., 2-seeded.

Mozamb. Dist. British Central Africa: Matabeleland; by the River Shasha, *Holub*, 1397!

56. **B. salicifolia**, *S. Moore in Journ. Bot.* 1880, 268. When young with spreading grey hairs and stellate hairs. Heads of flowers terminal on the stem and on short lateral spurs; floral leaves elliptic-lanceolate, not imbricated nor viscid nor yellow-brown. Anticous calyx-segment $\frac{3}{4}$ by $\frac{1}{2}$ in., nearly twice as broad as the posticous sepal. Ovules 2 in each cell, lower very small. Capsule scarcely $\frac{1}{3}$ in. long, 2-seeded; otherwise as *B. stellato-tomentosa*.—*B. stellato-tomentosa*, var. *ukambensis*, *Lindau in Engl. Jahrb.* xx. 23, and in *Engl. Pfl. Ost-Afr.* C. 368.

Nile Land. British East Africa: Ukamba, *Hildebrandt*, 2722! 2722A; Taita; Ndara Mountain, 1900 ft., *Hildebrandt*, 2457!

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5102! 5103! 5119!

Mozamb. Dist. German East Africa: Usambara; Uмба Valley, *Smith*!

This species, like *B. stellato-tomentosa*, shows remarkable variation in shape between the leaves on the same stem, and is (as *S. Moore* states) closely allied thereto. The heads, however, are different from the subglobose heads of *B. stellato-tomentosa*, closely enclosed by the viscid coloured imbricated outer ovate floral leaves.

57. **B. Hildebrandtii**, *S. Moore in Journ. Bot.* 1877, 69. Small rugged branched shrub, with persistent stellate-white and strigose-yellow hairs. Leaves 1 by $\frac{1}{3}$ in., elliptic, narrowed at both ends, sub-petioled, tip obtuse. Heads terminal, few-flowered, bract and calyx with stellate white and hispid yellow hairs; bract $\frac{1}{2}$ in. long, lanceolate. Posticous sepal $\frac{1}{2}$ by $\frac{1}{6}$ in.; anticous calyx-segment $\frac{1}{2}$ by $\frac{1}{5}$ in., 2-nerved,

tip minutely 2-toothed; 2 inner sepals $\frac{1}{4}$ in. long, linear. Corolla-tube $\frac{1}{2}$ in. long, linear-cylindric, a little narrowed at the top; lobes $\frac{1}{2}$ in. long, obovate. Anthers rather shorter than in the neighbouring species. Ovary glabrous, or very nearly so; ovules 2 in each cell, the lower much smaller, style glabrous with a dense cluster of short-stalked glands at the base.—Engl. Hochgebirgsfl. Trop. Afr. 391; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 314, and in Ann. Istit. Bot. Roma vi. [1896] 71; Rendle in Journ. Bot. 1897, 376.

Nile Land. Somaliland: Ahl Mountains, 4800–6500 ft., *Hildebrandt*, 866! Waggar Mountains, 5000 ft., *Mrs. Lort Phillips*! Ualema, *Riva*, 1629! British East Africa: Coast of South Somaliland at Tula River, *Kirk*!

This is very near the small-leaved form of *B. salicifolia*, but has a much smaller calyx.

58. **B. fulvostellata**, *C. B. Clarke*. Whole shrub with scattered persistent tawny stellate hairs. Leaves up to $2\frac{1}{4}$ in. long and broad, round, apiculate; petiole $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Cymes many, few-flowered, short, unilateral, axillary and terminal; barren bracts $\frac{1}{3}$ – $\frac{1}{2}$ in. long, linear, entire, not spinous; fertile bract $\frac{2}{3}$ by $\frac{1}{4}$ in., elliptic, acute, entire. Posticous sepal $\frac{2}{3}$ in. long and broad, entire, obtuse, becoming papery; anticous calyx-segment $\frac{2}{3}$ in. long, obovate, tip of 2 short round lobes; 2 lateral sepals $\frac{1}{2}$ in. long, ovate, falcate, subacute. Corolla $1\frac{1}{2}$ in. in total length, a deep purple-blue when dried. Pistil glabrous with a large entire cup-shaped disc.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, 2000–3000 ft., *Whyte*! Nyika Plateau, 6000–7000 ft., *Whyte*! 181!

59. **B. opaca**, *Nees in DC. Prod.* xi. 230. Straggling half-climbing shrub. Leaves $2\frac{1}{4}$ by $1\frac{1}{4}$ in., narrowed at both ends, when mature with scattered simple hairs on both faces; petiole 0 – $\frac{1}{3}$ in. long. Cymes very short, 3–1-flowered, approximated in the upper axils and running into a dense spike; floral leaves $\frac{1}{2}$ –1 in. long, sessile, similar to the lower leaves but smaller, hardly imbricated to form a strobilate spike; bract $\frac{1}{2}$ in. long, linear or scarcely spatulate. Posticous sepal nearly $\frac{1}{2}$ in. long, entire, quadrate-oblong, shortly apiculate, hairy; anticous segment rather shorter, 2-nerved, tip shortly 2-toothed; 2 inner sepals $\frac{1}{6}$ – $\frac{1}{5}$ in. long, linear. Corolla-tube $\frac{3}{4}$ –1 in. long, narrow funnel-shaped upwards; lobes $\frac{1}{2}$ in. long. Ovary glabrous; ovules 2 in each cell; style glabrous. Capsule $\frac{1}{2}$ in. long, compressed, ellipsoid, narrowed at each end, 2-seeded.—Benth. in Hook. Niger Fl. 480; T. Anders. in Journ. Linn. Soc. vii. 31; Cummins in Kew Bulletin, 1898, 77. *B. Afzelii*, Lindau MS. in Hb. Berol. *Justicia opaca*, Vahl, Enum. i. 133; Schumach. Beskr. Guin. Pl. 10.

Upper Guinea. Sierra Leone, *Brass*! Gold Coast: Accra, *Don*! Ashanti: Akroful, *Cummins*, 30! Volta Basin; Alafango, *Krause*! Lagos: Abeokuta, *Rowland*! and without precise locality, *Millen*, 46! 179! Niger Delta: Brass, *Don*! Cameroons: Buea, 6000 ft., *Preuss*, 714!

S. Moore in Journ. Bot. 1880, 263, asks whether this may not be a variety of *B. ventricosa*, which differs in its yellow-green colour, tawny hairs on the innovations, and less dense spikes.

60. **B. villosa**, *S. Moore in Journ. Bot.* 1880, 267. Rambling, 4 ft. high. Leaves $3\frac{1}{2}$ by $1\frac{1}{2}$ in., narrowed at both ends, villous with simple hairs on both surfaces; petiole up to 1 in. long. Inflorescence nearly as of *B. opaca*. Posticous sepal $\frac{2}{3}$ by $\frac{1}{6}$ in., entire; anticous calyx-segment bifid to $\frac{1}{3}$ of its length. Corolla blue-purple, tube yellowish; otherwise as *B. opaca*.

Lower Guinea. Angola: Golungo Alto, *Welwitsch*, 5070! 5071! Malange, *Buchner*, 138!

This species is near *B. opaca*, but has the two outer calyx-segments much narrower.

61. **B. ventricosa**, *Nees in DC. Prod.* xi. 230. Erect, 3–6 ft. high (*Nees*); strigose with tawny hairs prominent on the innovations. Leaves up to 2 by $\frac{3}{4}$ in., yellow-green; petiole 0– $\frac{1}{4}$ in. long. Spikes much less dense than in *B. opaca*, and with more numerous scattered cymes in remoter axils; otherwise as *B. opaca*.—*A. Rich. Tent. Fl. Abyss.* ii. 143; *T. Anders. in Journ. Linn. Soc.* vii. 30; *Solms-Laub. in Schweinf. Beitr. Fl. Aethiop.* 107, 243; *Engl. Hochgebirgsfl. Trop. Afr.* 391; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 314, in *Engl. Pfl. Ost-Afr. C.* 369, and in *Ann. Istit. Bot. Roma* vi. [1896] 71. *B. mollis*, *R. Br. in Salt, Abyss. Append.* 64. *B. angustiloba*, *Lindau in Engl. Jahrb.* xx. 20, and in *Engl. Pfl. Ost-Afr. C.* 369.

Nile Land. Eritrea: Bogos, 8000 ft., *Hildebrandt*, 466! Keren, *Steudner*, 1511! Aitala near Acrou, 5900 ft., *Schweinfurth & Riva*, 1346! near Ginda, 3000–3500 ft., *Schweinfurth & Riva*, 2118! 2199! Abyssinia: Tigre; Mount Sholoda, *Schimper*, 42! Mai Gouagoua, *Petit*! Mount Kubbi, *Schimper*, 797! Samen; Jaja, 6000 ft., *Schimper*, 389! Ankober, *Roth*, 486! Teramne, *Rohlf's & Stecker*! Choho, *Quartin-Dillon & Petit*, 296! and without precise locality, *Salt*! *Parkyns*! *Schimper*, 761! 1903! Somaliland: Harar, *Robecchi*, 7!

Mozamb. Dist. German East Africa, *Fischer*, 135!

62. **B. Grantii**, *Oliv. in Trans. Linn. Soc.* xxix. 127, t. 127. Shrub. Branches full of cystoliths, when young with opposite minutely hairy lines, when mature glabrate. Leaves 2 by $1\frac{1}{4}$ in., ovate, acute, with minute scattered hairs on both surfaces, base rounded; petiole 0– $\frac{1}{6}$ in. long. Cymes 2–1-flowered, principally in the upper axils, running into terminal spikes; bract $\frac{3}{4}$ in. long, linear. Posticous sepal nearly $\frac{3}{4}$ in. long, entire, ovate; anticous calyx-segment $\frac{2}{3}$ in. long, ovate, tip 2-toothed. Corolla blue; tube $\frac{2}{3}$ in. long, inflated in the upper half; lobes nearly $\frac{2}{3}$ in. long. Ovary and style glabrous; disc large, cup-shaped; ovules solitary (*Oliver*). Capsule $\frac{3}{8}$ in. long, 2-seeded (*Grant*).—*Lindau in Engl. Pfl. Ost-Afr. C.* 368. *Ruellia*, sp. n. 2, *T. Thoms. in Speke, Nile Append.* 643.

Nile Land. British East Africa: Madi; rocky banks of the Nile, *Grant*, 665!

Allied, as *Oliver* says, to *B. ruellioides*, *T. Anders.*, which has the flowers in condensed unilateral cymes.

63. **B. Linnogeton**, *S. Moore in Journ. Linn. Soc.* xv. 95. Villous, especially the young parts and inflorescence. Leaves 4 by 1 in., oblong,

narrowed at both ends; petiole $0-\frac{1}{4}$ in. long. Flowers in terminal strobilate spikes; floral leaves $\frac{1}{2}-\frac{3}{4}$ by $\frac{1}{2}$ in., round-ovate, densely grey-villous, imbricate; bract $\frac{3}{4}$ in. long, linear. Posticous sepal $\frac{1}{2}$ by $\frac{1}{10}$ in., entire, oblong; anticous calyx-segment $\frac{1}{3}$ by $\frac{1}{8}$ in., tip bifid. Corolla 1 in. long (*S. Moore*). Ovary glabrous, style-base hairy; ovule solitary in each cell or the lower minute.—Lindau in *Engl. Pfl. Ost-Afr. C.* 368.

Mozamb. Dist. Lake Tanganyika, *Cameron!*

64. **B. vix-dentata**, *C. B. Clarke*. Rambling, with short white and longer tawny hairs; branches up to 16 in. long. Leaves $2\frac{1}{2}$ by 1 in., elliptic, narrowed at both ends, when young villous, when mature more or less glabrate above and with cystoliths; petiole $0-\frac{1}{4}$ in. long. Inflorescence of 3-1-flowered short axillary racemes running into dense terminal spikes 4 by 1 in.; floral leaves $\frac{2}{3}$ in. long, similar to the lower leaves, much imbricate; bract $\frac{1}{2}$ by $\frac{1}{10}$ in. Posticous sepal $\frac{2}{3}$ by $\frac{1}{4}-\frac{1}{3}$ in., elliptic, villous, with few irregular subcrenate teeth on the margin; anticous calyx-segment $\frac{1}{2}$ in. long, obovate, obscurely toothed, tip of 2 obtuse lobes; 2 inner sepals $\frac{1}{2}$ in. long, linear. Corolla-tube exceeding $\frac{1}{2}$ in. long; lobes fully $\frac{1}{2}$ in. long. Ovary and style glabrous; ovules 2 in each cell, the lower very small; disc short, margin undulate. Capsule (*Scott-Elliot*, 7023) $\frac{1}{3}$ in. long, elliptic-compressed, 2-seeded.

Nile Land. British East Africa: Uganda, *Wilson*, 37! Ruwenzori; Wimi Valley, *Scott-Elliot*, 7940! Kavirondo, 4000-5000 ft., *Scott-Elliot*, 7023! Mau, 8000 ft., *Scott-Elliot*, 6928!

The species of *Barleria* numbered 64 to 76 form a very closely allied series. The plants here combined match; except *Scott-Elliot*, 7023, which has the inflorescence more axillary and the flowers smaller, and which approaches *B. Stuhlmanni* below.

65. **B. ruellioides**, *T. Anders. in Journ. Linn. Soc.* vii. 30. Plant 3 ft. high, young parts yellow-strigose. Leaves up to $4\frac{1}{2}$ by $1\frac{2}{3}$ in., broadly elliptic, attenuate at both ends, when mature with a few scattered small hairs and conspicuous cystoliths; petiole hardly any, i.e. winged to base. Racemes condensed 3-1-flowered, distant; bract minute, linear. Posticous sepal $\frac{2}{3}$ by $\frac{1}{2}$ in., ovate, not acute, with a few minute hairs and conspicuous cystoliths, becoming papery, reticulate, margin minutely toothed; anticous calyx-segment nearly similar. Corolla $1\frac{1}{2}$ in. long, nearly glabrous, blue. Ovary glabrous; ovules 2 in each cell, lower much smaller. Capsule $\frac{1}{2}$ in. long, elliptic, compressed, 2-seeded.

Upper Guinea. Niger Territory: Nupe, *Barter*, 932!

66. **B. Antunesi**, *Lindau in Engl. Jahrb.* xxii. 116. Branches hairy. Leaves $3\frac{1}{2}$ by $\frac{2}{3}$ in., oblong, narrowed at either end, when mature nearly glabrate, reticulate-nerved, with cystoliths and many circular sessile glands; petiole $0-\frac{1}{10}$ in. long. Inflorescence of 3 or 4 flowers approximate in the upper axils, densely softly villous; bracts $\frac{3}{4}$ by $\frac{1}{10}$ in., obtuse, soft. Anticous calyx-segment nearly 1 by $\frac{3}{5}$ in.,

ovate, entire, densely villous, notched $\frac{1}{10}$ in. down. Corolla-tube $\frac{3}{4}$ in. long; lobes large, round.

Lower Guinea. Angola: Huilla, *Antunes*, 185! *Capello*, 19!

67. **B. Holstii**, *Lindau in Engl. Jahrb.* xx. 19. Straggling 2-3 ft. long, young parts yellow-strigose. Leaves up to 7 by $1\frac{3}{4}$ in., elliptic, attenuate at both ends, when mature with scattered hairs and conspicuous cystoliths; petiole 0. Inflorescence of 3-1-flowered condensed unilateral racemes in distant axils; bract $\frac{2}{3}$ by $\frac{1}{5}$ in., lanceolate, falcate. Posticous sepal up to 1 by $\frac{1}{2}$ - $\frac{2}{3}$ in., ovate-triangular, acute, minutely toothed; anticous calyx-segment hardly $\frac{3}{4}$ in. long, ovate, 2-nerved, truncate, emarginate. Corolla $1\frac{1}{4}$ in. long, purple-blue. Ovary and style glabrous; ovules 2 in each cell.—*Lindau in Engl. Pfl. Ost-Afr. C.* 368.

Mozamb. Dist. German East Africa: Usambara; Mascheua, *Holst*, 3516!

68. **B. neurophylla**, *C. B. Clarke*. Nerves (primary and secondary) very conspicuous beneath the leaf. Posticous calyx-segment $\frac{1}{2}$ - $\frac{2}{3}$ in. long, ovate, obtuse, scarcely toothed; otherwise as *B. Holstii*.

Mozamb. Dist. Lake Tanganyika; Kavala Isles, *Carson*!

Possibly a form only of *B. Holstii*; but from only one branchlet of each it is difficult to form an opinion concerning specific separability.

69. **B. repens**, *Nees in DC. Prod.* xi. 230. Prostrate, 1-2 ft. long, young parts yellow-strigose. Leaves $1\frac{1}{2}$ by $\frac{3}{4}$ in. (larger in cultivated examples), shortly villous, afterwards more or less glabrate, tip triangular, base attenuate sometimes to the base of the petiole. Racemes scattered, 2-1-flowered; bract minute, linear. Two outer calyx-segments sub-similar, up to $\frac{3}{4}$ by $\frac{1}{2}$ - $\frac{2}{3}$ in., ovate, sparsely hairy, subentire, ultimately membranous reticulate, tip triangular. Corolla $1\frac{1}{2}$ in. long, pink; tube linear, narrowly funnel-shaped upwards. Ovary and style glabrous. Capsule $\frac{1}{2}$ - $\frac{3}{4}$ in. long, 2-seeded, or 4-seeded with the 2 lower seeds considerably smaller.—*T. Anders. in Journ. Linn. Soc.* vii. 31; *Hook. f. Bot. Mag.* t. 6954 partly; *Lindau in Engl. Pfl. Ost-Afr. C.* 369.

Mozamb. Dist. Zanzibar, *Kirk*! Pemba Island, *Bojer*! Kilwa Island, *Kirk*! Portuguese East Africa; Inhambane, *Scott*!

70. **B. querimbensis**, *Klotzsch in Peters, Reise Mossamb.* 205. Branches strigose with erect simple hairs. Leaves $1\frac{1}{4}$ by $\frac{2}{3}$ in., broadly elliptic, triangular at either end, when young yellow-strigillose, when mature glabrate; petiole $\frac{1}{8}$ in. long. Flowers 1 (rarely 2) in the upper axils, very shortly pedicelled; bracts linear, minute. Posticous sepal 1 by $\frac{1}{2}$ in., ovate-triangular, acute, apiculate, cordate at the base, soon becoming scarious, reticulate, glabrate (young nerves yellow-strigillose). Corolla rose; tube 1 in. long, funnel-shaped at the top; limb $\frac{1}{2}$ in. long. Capsule $\frac{3}{4}$ in. long, 4-seeded, glabrous.—*Lindau in Engl. Pfl. Ost-Afr. C.* 368.

Mozamb. Dist. Portuguese East Africa: Kerimba Islands, *Peters!* Quilimane, *Stuhlmann*, 564!

71. **B. Boehmii**, *Lindau in Engl. Jahrb.* xx. 19. Sparsely hairy. Leaves $1\frac{1}{4}$ by $\frac{2}{3}$ in., elliptic, very sparsely hairy, tip obtuse, base narrowed; petiole $\frac{1}{2}$ in. long. Flowers very shortly stalked, solitary, axillary. Posticous sepal nearly $\frac{1}{2}$ in. long, ovate; anticous calyx-segment rather shorter, tip 2-toothed. Corolla blue; tube $\frac{2}{3}$ in. long; limb nearly $\frac{1}{2}$ in. long.—*Lindau in Engl. Pfl. Ost-Afr. C.* 368.

Mozamb. Dist. German East Africa: Kakoma, *Böhm*, 25!

72. **B. Volkensii**, *Lindau in Engl. Jahrb.* xx. 22. Rambling shrub, young parts yellow-strigose. Leaves up to 2 by 1 in., ovate, when mature with a few scattered small hairs and conspicuous cystoliths on both surfaces, tip triangular subacute, base truncate (with sometimes a very small triangular attenuation on the petiole); petiole $0-\frac{1}{2}$ in. long. Inflorescence of 3-1-flowered condensed racemes, scattered; bract $\frac{1}{3}$ in. long, linear-lanceolate. Posticous sepal up to $\frac{3}{4}$ by $\frac{2}{3}$ in., ovate-rhomboid, minutely toothed, tip triangular; anticous calyx-segment $\frac{1}{2}-\frac{2}{3}$ in. long and broad, 2-nerved, tip of two short triangular teeth; 2 inner sepals $\frac{1}{4}$ in. long, linear. Corolla $1\frac{1}{2}-2$ in. long, purple-blue; tube oblong-campanulate for more than half its length. Ovary and style glabrous; ovules 2 in each cell, the lower very much smaller; disc nearly $\frac{1}{2}$ the length of the ovary, cup-shaped, toothed.—*Lindau in Engl. Pfl. Ost-Afr. C.* 369. *B. repens*, *Hook. f. Bot. Mag. t.* 6954 partly (i.e. Wakefield's plant). *B. submollis*, *Lindau in Engl. Jahrb.* xx. 21, and in *Engl. Pfl. Ost-Afr. C.* 369 partly (i.e. Kilimanjaro plant). *B. Boivini*, *Lindau in Engl. Pfl. Ost-Afr. C.* 369 ? not of T. Anders. *Parabarleria Boivini*, *Baill. in Bull. Soc. Linn. Paris*, ii. 837.

Nile Land. British East Africa: near Mombasa and Nyika country, *Wakefield!* 40-60 miles from the coast, *Johnston!* Taita, *Hildebrandt*, 2416!

Mozamb. Dist. German East Africa: Kilimanjaro; "Kwa Kinabo," 4800 ft., *Volkens*, 380! Lake Chala, *Volkens*, 314! Usambara; Mascheua, *Holst*, 3577A! Uмба Valley, *Smith!*

73. **B. Stuhlmanni**, *Lindau in Engl. Jahrb.* xx. 20. Villous. Leaves $1\frac{1}{2}$ by $\frac{3}{4}$ in., narrowed at both ends; petiole $0-\frac{1}{6}$ in. long. Inflorescence of 3-1-flowered dense racemes, scattered and also approximated at the ends of branchlets. Posticous sepal less than $\frac{1}{3}$ in. long, ovate, minutely toothed; anticous calyx-segment nearly as long, broadly ovate, tip with 2 acute triangular lobes. Corolla in total length $\frac{3}{4}$ in., purple-blue when dried. Stamens and pistil of the genus; ovules 2 in each cell, the lower minute.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 314, and in *Engl. Pfl. Ost-Afr. C.* 368. *B. mollis*, *Lindau in Engl. Jahrb.* xvii. 159. *B. submollis*, *Lindau in Holst, Exsicc. n.* 8736, 8935; *Rendle in Journ. Bot.* 1896, 395; not *Lindau in Engl. Jahrb.* xx. 21.

Nile Land. British East Africa: Kapte Plateau, 5000-6000 ft., *Thomson!* Mau, 7000-8000 ft., *Scott-Elliot*, 6791! between the River Jub and Lake Stefanie, *Donaldson Smith.*

Mozamb. Dist. German East Africa: Usambara; Mascheua, *Holst*, 3515! 8736! Kwa Mshuza, *Holst*, 8935! Usagara, *Stuhlmann*, 289!

The description of *B. submollis*, Lindau, "leaves subcordate, corolla-tube 1 in., lobes $\frac{1}{2}$ in.," appears taken from *Volkens*, 314; and cannot apply to *Holst*, 8736 (whence the above description of *B. Stuhlmanni* is drawn), though this Usambara plant is the one repeatedly named by Lindau as *submollis*. These species of *Barleria* are very close together, and the number of species hereafter admitted may be greater than that enumerated here.

74. ***B. micrantha***, *C. B. Clarke*. Young parts tawny villous. Leaves up to $2\frac{3}{4}$ by 1 in., ovate-elliptic, subacute at either end, when mature with few scattered small hairs and conspicuous cystoliths; petiole $0-\frac{1}{3}$ in. long. Inflorescence in 3-1-flowered dense racemes, scattered in remote axils. Posticous sepal $\frac{1}{2}$ by $\frac{1}{3}$ in., rhomboid, definitely toothed; anticous calyx-segment similar, rather smaller, tip with 2 acute triangular lobes. Corolla in total length hardly $\frac{2}{3}$ in., trumpet-shaped, purple-blue when dried. Stamens and pistil of the genus.

Nile Land. East side of Lake Albert Edward, *Scott-Elliot*!

In the larger, sparsely hairy leaves, this species resembles *B. Grantii* and *B. ruellioides*; but the corolla is far too small to arrange it under either of these.

75. ***B. usambarica***, *Lindau in Engl. Jahrb.* xx. 21. Villous, 6-10 in. long. Leaves $\frac{3}{4}$ by $\frac{1}{2}$ in., tip triangular, base rounded; petiole $0-\frac{1}{8}$ in. long. Inflorescence in 2-1-flowered scattered racemes; bracts $\frac{1}{8}$ in. long, linear-lanceolate. Posticous sepal $\frac{1}{3}$ in. long and broad, acute, subentire; anticous calyx-segment $\frac{1}{3}$ in. long, obovate, 2-nerved, minutely 2-toothed. Corolla in total length $\frac{3}{4}$ in.; tube in the upper half funnel-shaped. Ovary glabrous; style with scattered hairs in the lower part. Capsule less than $\frac{1}{3}$ in. long, compressed ellipsoid, 2-seeded. —Lindau in *Engl. Pfl. Ost-Afr. C.* 369.

Mozamb. Dist. German East Africa: Usambara, Duga, *Holst*, 3165!

Much smaller than any other species.

76. ***B. rotundisepala***, *Rendle in Journ. Bot.* 1897, 376. Small, densely strigose shrub. Leaves up to $1\frac{1}{4}$ by $\frac{3}{4}$ in., obtuse, grey-strigose on both faces, narrowed at the base; petiole $\frac{1}{8}$ in. long. Flowers solitary, shortly pedicelled above 2 reduced leaves. Posticous sepal orbicular, nearly $\frac{1}{2}$ in. long, densely strigose without; anticous calyx-segment similar but rather smaller; two inner sepals $\frac{1}{8}$ in. long, lanceolate. Corolla $\frac{3}{4}$ in. long, or rather more. Style-base and ovary-top shortly hairy.

Nile Land. British Somaliland: Waggar Mountains, *Mrs. Lort Phillips*!

Rendle thinks this species may belong to the subgenus *Somalia*. In the absence of fruit, this can hardly be settled; I guess its affinity to be with *B. usambarica*.

Imperfectly known species.

77. **B. damarensis**, *T. Anders. in Journ. Linn. Soc. vii. 29.* Pubescent. Leaves ovate, acute, mucronate, entire, puberulous. Bracts "broad subulate," mucronate. Calyx-segments lanceolate, mucronulate, entire, puberulous. Corolla-tube equal, twice as long as the calyx.

Lower Guinea. German South-west Africa: Damaraland; in Dublin Herbarium, without collector's name.

This species is said to be allied to *B. meyeriana* and *B. lancifolia* (supposed = *B. alata*, S. Moore); but as *B. meyeriana* and *B. alata* have been referred to different groups, this does not assist us to the affinity.

78. **B. acanthophora**, *Nees in DC. Prod. xi. 726.* Erect under-shrub, 1 ft. high. Leaves small, ovate, entire, opposite, hairy; stipules and bracts spinescent. Flower solitary, lateral, peduncled, pale violet. Calyx of 2 erect acuminate leaves. Corolla-tube long, filiform, curved at the base; limb 5-fid, patent. Stamens 2, exserted. Style short; stigma simple, thick. Capsule superior, ovate, 2-celled, many-seeded.—*Eranthemum spinosum*, Lour. Fl. Cochinch. [ed. Willd.] i. 24. *E. acanthophorum*, Roem. & Schultes, Syst. i. Mant. 154.

Mozamb. Dist. Portuguese East Africa: In the suburbs of Mozambique, Loureiro.

The above is abstracted from Schultes. The many seeded-capsule with long filiform corolla-tube and spinous stipules form a combination of characters difficult to find in *Acanthaceæ*, throwing aside even the calyx.

79. **B. Descampsi**, *Lindau in Engl. Jahrb. xxiv. 318.* Whole plant villous-hairy. Leaves $2\frac{1}{2}$ by $\frac{1}{3}$ in., ovate, short-petioled. Flowers solitary in the axils, simulating a terminal spike; bracteoles lanceolate, exceeding $\frac{1}{2}$ in. in length. Calyx $\frac{3}{4}$ in. long; anticous segment 2-toothed. Corolla-tube $\frac{2}{3}$ in. long; lobes $\frac{3}{4}$ in. long. Ovary hairy at the tip.

South Central. Congo Free State: Mount Pueto, *Descamps.*

37. **ERANTHEMUM**, Linn. partly; Benth. et Hook. f. Gen. Pl. ii. 1097.

Calyx small (usually hardly $\frac{1}{4}$ in. long), divided to the base; sepals 5, equal, linear-lanceolate. Corolla-tube $\frac{3}{4}$ – $1\frac{1}{2}$ in. long, linear, hardly dilated at the top; lobes 5, subequal, $\frac{1}{4}$ – $\frac{1}{2}$ in. long, elliptic, spreading or recurved, anticous outside in bud. Stamens 2, anticous fertile; filaments glabrous; anther-cells 2, oblong, parallel, muticous or minutely mucronate at the base; pollen globose, with 3 longitudinal smooth depressions, not reaching the pole; 2 posticous stamens rudimentary. Pistil glabrous (in African plants); ovary oblong; ovules 2 in each cell; stigmas 2, subequal, minute, subcoalescent. Capsule 4-seeded at the top, on a long solid stalk; seeds without hairs, compressed, one face rugose, the other honeycombed.—Under-shrubs.

Leaves entire. Inflorescence in long spikes of contracted linear panicles, terminal often peduncled; flowers one to each bract, or clustered (condensed simple or compound cymes) in the linear panicles; bract minute; bracteoles 0.

Species 50 (many of them very closely allied), scattered through the warmer parts of the world.

This genus is frequently confounded with *Rhinacanthus*, which is easily separated by its anther-cells being one over the other. As to the pollen, I can find no definite line between the Spangen-pollen and the Rahmen-pollen of Lindau; the smooth depressions lateral to the stopples may unite in bands, while the central depression stops short of the pole (as depicted by Lindau for *Graptophyllum*).

Rhachis of inflorescence and calyx with stalked glands (as well as hairs).

Leaves usually 2-3 in. wide, when mature glabrescent 1. *E. decurrens*.

Leaves 1-1½ in. wide, when mature pubescent on the midrib beneath 2. *E. senense*.

Rhachis of inflorescence with no stalked glands (often hairy).

Species of West Africa.

Flowers nearly all solitary in the axils of bracts on a slender spike 3. *E. nigritianum*.

Axillary dense cymes in a linear panicle.

Rhachis of panicle glabrous 4. *E. hypocrateriforme*.

Rhachis of panicle pubescent 5. *E. ludovicianum*.

Species of East Africa.

Rhachis of inflorescence glabrous, shining brown 6. *E. Hildebrandtii*.

Rhachis of inflorescence pubescent or puberulous.

Leaves ovate or elliptic.

Rhachis and calyx with few white bristly hairs 7. *E. seticalyx*.

Rhachis and calyx with dense minute papillose hairs 8. *E. subviscosum*.

Rhachis and calyx with several-celled hairs 9. *E. Lindau*.

Leaves large, narrowly elongate-obovate 10. *E. ardisioides*.

1. ***E. decurrens***, *Nees in DC. Prod.* xi. 453. Branches glabrescent, round or obscurely 4-lineate. Leaves commonly 4 by 2 in., up to 9 by 3¾ in., at the base ovate, suddenly narrowed into a long attenuation, when young sparsely pubescent, when mature glabrescent; cystoliths in the upper surface very small, rather conspicuous, in the lower surface obscure; petiole (excluding the winged portion) rarely ½ in. long. Spikes 4-6 in. long, pubescent and with stalked glands; flowers mostly solitary, sometimes 2-3 subsessile. Calyx ¼ in. long or rather more, glandular hairy. Corolla yellowish; tube 1 in. long, pubescent. Capsule 1 in. long, seeds ⅕ in. in diam.—*A. Rich. Tent. Fl. Abyss.* ii. 158; *T. Anders. in Journ. Linn. Soc.* vii. 52; *Zarb, Cat. Spéc. Bot. Pfund*, 32. *Pseuderanthemum decurrens*, *Radlk. in Sitz.-ber. Bayr. Akad.* xiii. 286; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 330, and in *Engl. Jahrb.* xviii. 63, t. 2, fig. 58.

Nile Land. Kordofan, *Pfund*, 435! 436! 444! *Kotschy*, 276! *Æthiopia*, *Kotschy*, 450! *Abyssinia*, *Quartin-Dillon & Petit*, 298! *Schimper*, 773, 1463! **British East Africa:** *Jur*; *Dimo*, *Schweinfurth*, 4264!

2. **E. senense**, *Klotzsch in Peters, Reise Mossamb. Bot.* 219. Leaves up to $4\frac{1}{2}$ by $1\frac{1}{4}$ in., when mature minutely pubescent on the midrib beneath; cystoliths on the under surface small, numerous, sub-conspicuous; base of leaves long attenuate; petiole winged or hardly any. Spikes 6–12 in. long, very slender; flowers solitary; otherwise nearly as *E. decurrens*, Nees.—*Pseuderanthemum senense*, Radlk. in Sitz.-ber. Bayr. Akad. xiii. 286, not of Lindau.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; Rios de Sena, *Peters!* Lupata, *Kirk!*

This plant is more pubescent than *E. decurrens*, with slender leaves and spikes and rather smaller flowers. The numerous stalked glands of the rhachis on the spike and the calyx are not seen in the nearly allied plant issued by Lindau as *E. senense*, Klotzsch.

3. **E. nigritianum**, *T. Anders. in Journ. Linn. Soc.* vii. 51. A slender shrub, 8–20 in. high. Leaves $4\frac{1}{2}$ by $1\frac{3}{4}$ in., elliptic, when mature glabrous; cystoliths on both surfaces rather obscure; petiole $0-\frac{1}{3}$ in. long. Spikes 2–5 in. long, slender; flowers nearly all solitary; rhachis minutely pubescent. Sepals $\frac{1}{6}$ in. long, minutely pubescent, corolla mauve or nearly white; tube $\frac{3}{4}$ in. long, nearly glabrous outside. Capsule $\frac{3}{4}$ in. long.—S. Moore in *Journ. Bot.* 1880, 308. *E. plumbeo-ginoides*, P. Maury in *Journ. de Bot.* ii. 264–267 with figure. *Pseuderanthemum nigritianum*, Radlk. in Sitz.-ber. Bayr. Akad. xiii. 286; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 330. *Justicia tunicata*, Afzel. *Remed. Guin.* iii. 17; Nees in *DC. Prod.* xi. 428.

Upper Guinea. Sierra Leone: near Kukuna, by the Scarcies River, *Scott-Elliot*, 4692! and without precise locality, *Afzelius!* Togoland, *Baumann*, 375! Lagos: Eppah, *Barter*, 3300! Cameroons: Victoria, *Preuss*, 1108! 1298! 1366! *Johnston!* Yaunde, 2600 ft., *Zenker & Staudt*, 581! *Zenker*, 815! Batanga, *Bates*, 23! Fernando Po, *Buchholz!* *Mann*, 156!

Lower Guinea. Gaboon: Gaboon River, *Mann*, 997! *Büttner*, 359! Sierra del Crystal, *Mann*, 1708! Angom, *Bates*, 564! Loango: near Majumbe, *Soyaux*, 135! 155! Angola: Pungo Andongo, *Welwitsch*, 5177! 5192!

South Central. Lunda: Bashilange; Mukenge, *Pogge*, 988!

4. **E. hypocrateriforme**, *Roem. & Schultes, Syst.* i. 175. Shrub 3–4 ft. high. Branches glabrous, with 4 raised lines. Leaves up to $3\frac{1}{2}$ by $1\frac{1}{2}$ in., ovate or elliptic, when mature glabrous, minutely white-dotted on both surfaces, reticulate-veined beneath; cystoliths very obscure; petiole $0-\frac{1}{3}$ in. long. Panicles linear, 2–7 in. long; axillary cymes dense, several-flowered, lower more or less spreading, sometimes up to 1 in. long, compound; rhachis minutely pubescent. Sepals $\frac{1}{3}$ in. long, glabrous or very nearly so. Corolla scarlet; tube 1 in. long, nearly glabrous without. Capsule $1\frac{1}{4}$ in. long.—Nees in *DC. Prod.* xi. 454; Benth. in *Hook. Niger Fl.* 484; T. Anders. in *Journ. Linn. Soc.* vii. 52. *E. affine*, *Spreng. Syst.* i. 89. *Justicia hypocrateriformis*, *Vahl, Enum.* i. 165; *Schumach. & Thonn. Beskr. Guin. Pl.* 11. *Pseuderanthemum hypocrateriforme*, Radlk. in Sitz.-ber. Bayr. Akad. xiii. 286; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 330 partly.

Upper Guinea. Sierra Leone: near Wallia on the River Scarcies, *Scott-Elliot*, 4451! and without precise locality, *Vogel*, 159! *Winwoode Reade*! *Smeathmann*! Gold Coast: Accra, *Don*! *Krause*, 60! Adrafo, *Krause*, 59! Lagos: on rocks at Eruva, *Rowland*!

5. ***E. ludovicianum***, *Büttner*. in *Verh. Bot. Brandenb.* xxxii. 41. Shrub, up to 12 ft. high; branches round; stem quadrangular (*Büttner*). Leaves 7 by $2\frac{1}{4}$ in., elliptic, when mature glabrous, upper surface with scattered subobscure cystoliths, lower surface closely and minutely round-dotted; petiole up to 1 in. long. Panicle 6 by $\frac{3}{4}$ in.; axillary condensed cymes 3–8-flowered; rhachis minutely pubescent. Calyx $\frac{1}{8}$ in. long, minutely pubescent. Corolla-tube 1 in. long, nearly glabrous without; lobes $\frac{1}{3}$ in. long.—*E. Mannii*, T. Anders. MS. *Pseuderanthemum ludovicianum*, Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 330; *Wild. et Dur. Ill. Fl. Congo*, i. (1899), p. 63, t. 32.

Upper Guinea. Ashanti: Assin-Yan-Coomassie, *Cummins*, 237! Cameroons: Yaunde, *Staudt*, 537! *Zenker*, 418! *Preuss*, 598! Fernando Po, *Mann*, 1437!

South Central. Lunda: Muene-Putu-Kassongo, *Büttner*, 460!

6. ***E. Hildebrandtii***, *C. B. Clarke*. A shrub 3–6 ft. high, nearly glabrous. Branches terete or quadrangular. Leaves up to $4\frac{1}{2}$ by $1\frac{3}{4}$ in., ovate or elliptic; cystoliths many slender on the surfaces; petiole 0–1 in. long (leaf base often long decurrent on a quasi-winged petiole). Panicles linear, 1–3 in. long, often terminal on lateral branches, running into a large compound inflorescence; rhachis glabrous, shining brown; otherwise as *E. hypocrateriforme*.—*E. hypocrateriforme*, Rendle in *Journ. Bot.* 1896, 398. *Pseuderanthemum Hildebrandtii*, Lindau in *Engl. Jahrb.* xx. 39, and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 330, and in *Engl. Pfl. Ost-Afr.* 371.

Nile Land. Somaliland: Sheikh Husein, *Donaldson Smith*! British East Africa: Rabai Hills near Mombasa, *Hildebrandt*, 2308! Nyika country near Mombasa, *Wakefield*!

Mozamb. Dist. Zanzibar, *Kirk*! *Hildebrandt*, 981! German East Africa: Usambara; Duga, *Holst*, 3159! Mascheua, *Holst*, 8800! Tanga, *Holst*, 2110! Magila, *Kirk*! between Magila and the River Sigi, *Volkens*, 64! Usaramo, *Stuhlmann*, 8988!

Hildebrandt, 981, has terete branches. The present species is separated from *E. hypocrateriforme* by the shining-brown glabrous rhachis, and the leaves not reticulately veined beneath.

7. ***E. seticalyx***, *C. B. Clarke*. Branches roundish, glabrate, with the rhachis of inflorescence pubescent upwards. Leaves up to $4\frac{1}{4}$ by 2 in., ovate (in some of *Kirk*'s examples 7 by $3\frac{3}{4}$ in.), when young often very hairy, when mature rarely quite glabrate; cystoliths scattered, obscure; petiole 0–1 in. long. Panicles 2–3 by $\frac{1}{2}$ in., dense. Calyx $\frac{1}{8}$ in. long, nearly glabrous or with white spreading small bristles, also seen on the rhachis. Corolla-tube 1 in. long, pubescent without.

Mozamb. Dist. German East Africa: Mountains east of Lake Nyasa, *Johnson!* British Central Africa: Nyasaland: Kondowe to Karonga, 2000–6000 ft., *Whyte*, 315! Songwe and Karonga, 1700–2000 ft., *Whyte*, 6! Zomba Rock, *Whyte!* Blantyre, *Simon!* Manganja Hills, near Shibisa (Chikwawa), 200–300 ft., *Kirk!* and without precise locality, *Buchanan*, 302! 1204!

8. **E. subviscosum**, *C. B. Clarke*. Branches roundish, glabrate. Leaves up to $8\frac{1}{2}$ by 2 in., elliptic-lanceolate, when mature usually quite glabrous; cystoliths scattered, obscure on both faces; petiole 0–1 in. long. Panicles 2–5 in. long, linear; rhachis minutely pubescent. Calyx $\frac{1}{8}$ in. long, almost sticky from numerous short and almost papillose hairs (without terminal glands). Corolla, pollen, and capsule as of *E. seticalyx*.—*Pseuderanthemum hypocrateriforme*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 330 partly, and in Engl. Pfl. Ost-Afr. C. 371.

Nile Land. British East Africa: Uganda, *Stuhlmann*, 1397!

Mozamb. Dist. Portuguese East Africa: Makua; Namuli Hills, *Last!* British Central Africa: Nyasaland; Shibisa (Chikwawa) to Tshinmuze, 2000–4000 ft., *Kirk!* Mount Chiradzulu, 200–1000 ft., *Meller!* Mount Mlange, 4000 ft., *McClounie*, 60! and without precise locality, *Buchanan*, 449! 558!

9. **E. Lindaui**, *C. B. Clarke*. Stem 10 in. long, undivided, terete, glabrate. Leaves up to $7\frac{1}{2}$ by $2\frac{3}{4}$ in., ovate, when mature glabrous or minutely bristly on the midrib beneath; cystoliths numerous, small; petiole 0–1 in. long. Spike terminal, $4\frac{1}{2}$ in. long, very slender; flowers solitary, distant; rhachis with small many-jointed hairs, not gland-tipped. Calyx $\frac{1}{8}$ in. long, puberulous. Corolla-tube $\frac{3}{4}$ in. long.—*Pseuderanthemum senense*, Lindau in Engl. Pfl. Ost-Afr. C. 371.

Mozamb. Dist. German East Africa: Usambara, Mascheua, *Holst*, 3494! Nderema, *Holst*, 2251!

This is *E. senense*, Lindau, but has no gland-tipped hairs. The hairs are of several cells, often alternately broad and narrow, empty or filled with brown oil. Except for these hairs, and the considerably smaller corolla, the plant might be united with *E. subviscosum*.

10. **E. (?) ardisioides**, *C. B. Clarke*. Branches terete, rather stout, glabrous. Leaves up to 11 by 3 in., elongate-obovate, when mature glabrous; cystoliths obscure; petiole $\frac{1}{2}$ in. long. Panicles 2–3 by $\frac{1}{2}$ in., dense upwards, nearly glabrous. Calyx $\frac{1}{8}$ in. long, minutely pubescent. Corolla (not expanded but) tube short for the genus. Stamens 2, with rudiments of filaments of posticous stamens; anthers oblong, parallel, muticous, with stalked glands on connective and on the upper part of the filament; pollen ellipsoid, narrowed at both ends, acutely triangular, the 3 bands not reaching the pole; pistil and capsule (half-ripe) of the genus.

Nile Land. British East Africa: Uganda, *Scott-Elliot*, 7521!

38. **RUSPOLIA**, Lindau in Ann. Istit. Bot. Roma vi. [1896] 79.

Anthers 1-celled; otherwise as *Eranthemum*.

Monotypic.

1. **R. pseuderanthemoides**, Lindau in Ann. Istit. Bot. Roma vi. [1896] 80. Shrub; innovations hairy. Leaves up to 3 by $1\frac{1}{4}$ in., narrowed at either end, hispid, ultimately glabrate, beautifully reticulate-veined beneath; petiole up to $\frac{2}{3}$ in. long. Spikes hardly 1 in. long, terminal on lateral branches, subglobose; bracts nearly $\frac{1}{3}$ in. long, linear, hispid. Calyx-segments 5, subequal, $\frac{1}{3}$ in. long, subulate, rusty-pubescent. Corolla-tube $\frac{3}{4}$ –1 in. long, linear-cylindric, not inflated at the top; lobes 5, subequal, ovate, patent. Stamens 2, not exerted; anthers of 1 hemi-ellipsoid cell; filaments glabrous; pollen globose, with 3 large stopples, and longitudinal smooth depressions reaching the pole. Pistil glabrous; style with 2 small subequal oblong lobes. Capsule $1\frac{1}{4}$ in. long, stalked, narrow-ellipsoid (all seen are 1-seeded with the lower ovule infertile); seeds nearly smooth.—Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 307.

Nile Land. Somaliland: Dava River, *Riva*, 1418!

This plant is exceedingly like *Eranthemum hypocrateriforme*. Lindau makes the present genus have "Rahmen-pollen," and to thus differ from *Eranthemum* (which has Spangen-pollen") and be nearer *Graptophyllum*. *Ruspolia* appears to me hardly worth separating from *Eranthemum*. I see no tangible difference in the pollen.

39. **RUTTYA**, Harvey; Benth. et Hook. f. Gen. Pl. ii. 1105.

Calyx 5-partite nearly to the base; segments equal, narrowly lanceolate. Corolla with 2 large lips; posticous emarginate; anticous 3-lobed. Stamens 2 (with 2 rudiments); anthers 1-celled, mucronate at the base; pollen subglobose, nearly smooth, stopples 3 large. Ovary and style glabrous; branches of the style 2, very small, equal; ovules 2 in each cell. Capsule ellipsoid, 4-seeded, long-stalked; seeds without hairs, nearly smooth.—Leaves entire. Flowers purple, in short cymes; bracts and bracteoles scarcely $\frac{1}{4}$ in. long, linear.

Species 2, in East and South Africa, 1 extending to Arabia.

In this genus the herbaceous petioles disarticulate, leaving small wooden cuplike scars.

Calyx $\frac{1}{3}$ in. long, pubescent 1. *R. speciosa*.

Calyx $\frac{1}{16}$ – $\frac{1}{8}$ in. long, nearly glabrous 2. *R. fruticosa*.

1. **R. speciosa**, Engl. Hochgebirgsfl. Trop. Afr. 392. Shrub, 3–5 ft. high; branches glabrate. Leaves $3\frac{1}{2}$ by $\frac{1}{2}$ in., narrowed at both ends, when mature nearly glabrous; cystoliths many small on both surfaces; petiole 0– $\frac{1}{3}$ in. long. Cymes 1 in. long, often terminal on axillary branches, minutely and densely hairy; bracteoles $\frac{1}{6}$ in. long, often about the middle of the pedicel. Calyx $\frac{1}{3}$ in. long, minutely pubescent. Corolla $1\frac{1}{4}$ in. long, nearly glabrous; tube $\frac{1}{3}$ in. long, cylindric, widened

upwards; lips curved. Filaments glabrous; anthers $\frac{1}{8}$ in. long. Capsule 2 in. long, 4-seeded, glabrous; stalk 1 in. long, stout, solid.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 283, fig. 112, C. and 340. *Haplanthera speciosa*, Hochst. in Flora, 1843, 72; Nees in DC. Prod. xi. 308; A. Rich. Tent. Fl. Abyss. ii. 152; T. Anders. in Journ. Linn. Soc. vii. 51; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 243.

Nile Land. Abyssinia: Samen; Debra Gönnet, *Steudner*, 1538! on mountain sides along the banks of the Tacazze River, *Schimper*, 769! and without precise locality, *Schimper*, 1407! *Plowden*!

2. **R. fruticosa**, *Lindau in Engl. Jahrb.* xx. 45. Leaves 1–2 in. long. Calyx $\frac{1}{16}$ – $\frac{1}{8}$ in. long, nearly glabrous. Corolla hardly 1 in. long; otherwise as *R. speciosa*.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 340, in Engl. Pfl. Ost-Afr. C. 372, and in Ann. Istit. Bot. Roma vi. [1896] 81; Rendle in Journ. Bot. 1896, 398.

Nile Land. Somaliland: Ahl Mountains, 5000–6500 ft., *Hildebrandt*, 893! Upper Shiekh, *Gillett*! Sheikh Husein, *Donaldson Smith*!

Mozamb. Dist. German East Africa: Kilimanjaro; at Lake Chala, *Volkens*, 323.

Lindau says this species has the capsule 2-seeded, but the capsule is 4-seeded in the two fruiting examples at Berlin.

40. **MONOTHECIUM**, Hochst.; Benth. et Hook. f. Gen. Pl. ii. 1104.

Calyx 5-fid to the base; segments equal, linear. Corolla small, 2-lipped; posticous lip emarginate; anticous 3-lobed. Stamens 2; anthers 1-celled, muticous; pollen globose with 3 stopples; longitudinal depressions narrow, not reaching the pole. Ovary and style-base hairy; branches of style 2, equal, very short oblong; ovules 2 in each cell. Capsule oblong, 4- (or 2-) seeded, lower part contracted; seeds discoid, wrinkled, without hairs.—Small shrubs. Leaves entire. Spikes dense, many-flowered, terminal; bracts and bracteoles linear or bristle-like.

Species 2, one of which extends to India.

- | | |
|--|----------------------------|
| Mature leaves hairy on both surfaces; bracteoles with gland-tipped hairs | 1. <i>M. glandulosum</i> . |
| Mature leaves slightly hairy; bracteoles without gland-tipped hairs | 2. <i>M. aristatum</i> . |

1. **M. glandulosum**, *Hochst. in Flora*, 1843, 74. Hairy; branches up to 18 in. long. Leaves $2\frac{1}{2}$ by 1 in., ovate or elliptic, narrowed at both ends, when mature hairy on both surfaces; cystoliths obscure; petiole $0-\frac{1}{4}$ in. long. Spikes up to 4 by $\frac{1}{2}$ in., solitary, often interrupted at the base; outermost bracts (floral leaves) $\frac{1}{8}$ – $\frac{1}{6}$ in. long, lanceolate; bracts and bracteoles $\frac{1}{4}$ in. long, linear, hairy, and with many gland-tipped hairs. Corolla (whole length) $\frac{1}{3}$ – $\frac{1}{2}$ in. Capsule $\frac{1}{3}$ in. long, hairy, 4-seeded.—Nees in DC. Prod. xi. 310; A. Rich. Tent. Fl. Abyss. ii. 152; T. Anders. in Journ. Linn. Soc. vii. 45; Solms-Laub. in

Schweinf. Beitr. Fl. Aethiop. 112; Zarb, Cat. Spéc. Bot. Pfund, 32; Engl. Hochgebirgsfl. Trop. Afr. 392; Lindau in Engl. Jahrb. xviii. 63, t. 2, fig. 78, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 340. *Rostellularia glandulosa*, Nees in DC. Prod. xi. 373; A. Rich. Tent. Fl. Abyss. ii. 153. *Hypoestes Volkensii*, Lindau in Engl. Jahrb. xix. Beibl. n. 47, 47, and in Engl. Pfl. Ost-Afr. C. 371. *H. glandulosa*, Hochst. in Flora, 1843, 74.

Nile Land. Eritrea: near Ginda, *Schweinfurth & Riva*, 2197! Abyssinia: Mount Sholoda, near Adowa, *Schimper*, 346! near Mai Dogale, *Schimper*, 617! Agow Dist., near Bellaka, 6000–7000 ft., *Schimper*, 193! 2274! and without precise locality, *Schimper*, 753! 1156! British East Africa: east side of Lake Albert Edward, *Scott-Elliot*, 8068! and on rocks at Lake Elmeteita, 6000–7000 ft., *Scott-Elliot*, 6627!

Mozamb. Dist. Kilimanjaro, 3000–5000 ft., *Volkens*, 1580! 1607!

2. **M. aristatum**, *T. Anders. in Thwaites Enum. Pl. Zeyl.* 234. Leaves when mature very sparsely hairy; cystoliths plentiful on the lower surface. Spikes 1–2½ in. long, dense, often branched at the base; outermost floral leaves linear or bristle-like; bracts and bracteoles bristle-like, hairy, not viscid glandular; otherwise as *M. glandulosum*.—*Bedd. Ic. Pl. Ind. Or.* t. 269; *C. B. Clarke in Hook. f. Fl. Brit. Ind.* iv. 524; *S. Moore in Journ. Bot.* 1880, 309; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 340. *Justicia aristata*, Nees in Wall. Pl. As. Rar. iii. 315. *Anthocometes aristatus*, Nees in DC. Prod. xi. 312.

Lower Guinea. Angola: Golungo Alto, *Welwitsch*, 5155! 5197! 5198! Calomba, *Welwitsch*, 5134!

Also found in South Madras and Ceylon.

41. **OREACANTHUS**, Benth. in Benth. et Hook. f. Gen. Pl. ii. 1104.

Calyx small, divided to the base; segments 5, equal, linear. Corolla small, 2-lipped; tube campanulate, hardly $\frac{1}{10}$ in. long; lips nearly $\frac{1}{3}$ in. long, posticous subentire, anticous 3-lobed. Stamens 2; anthers long-exserted, 1-celled, muticous; pollen ellipsoid, with 2 longitudinal smooth depressions. Ovary and style-base glabrous; branches of the style 2, minute, equal, oblong; ovules 2 in each cell. Capsule oblong, 4-seeded, lower part contracted; seeds discoid, wrinkled, without hairs.—Shrub, up to 12 ft. high. Leaves entire. Panicle terminal, compound, lax, many-flowered, viscid-hairy; bracts very small, linear.

Species 1, endemic.

The pollen of this plant is figured by Lindau [in Engl. & Prantl, Pflanzenfam. iv. 3 B. 282, fig. 111, D, a b] as a typical example of "Guertel pollen." It is drawn there globose (or short-ellipsoid with transverse ribs), smooth with the patches round the stopples tubercular. I find the pollen definitely ellipsoid (not globose), with 2 longitudinal smooth depressions in which the stopples are placed. In a word, the pollen is that of *Justicia diffusa* (and many other small *Justicias*); but the genus should be *Duvernoia*, Lindau, if we depend on pollen alone for the genus.

1. **O. Mannii**, *Benth. in Benth. et Hook. f. Gen. Pl. ii. 1104.* Leaves up to $7\frac{1}{2}$ by 3 in., acuminate at either end, very slightly hairy, especially on the nerves beneath, margin obscurely crenulate; cystoliths subconspicuous on both surfaces; petiole 0–1 in. long. Panicle up to $11\frac{1}{2}$ by 7 in., with 100–200 flowers; bracts hardly $\frac{1}{8}$ in. long, linear. Calyx $\frac{1}{8}$ in. long. Corolla mauve or whitish. Capsule $\frac{2}{3}$ in. long.—Lindau in *Engl. & Prantl, Pflanzenfam. iv. 3 B. 345.*

Upper Guinea. Cameroons: Cameroon Mountain, 7000 ft., *Mann, 1259!* 1971! 8000 ft., *Johnston, 64! 65! Kalbreyer, 132! Preuss, 1078!*

42. **BRACHYSTEPHANUS**, Nees; *Benth. et Hook. f. Gen. Pl. ii. 1105.*

Calyx 5-partite nearly to the base; segments equal, linear. Corolla slender, 2-lipped; tube slender, hardly widened upwards; lips subentire, or the posticous emarginate, the anticous very shortly 3-lobed. Stamens 2; filaments glabrous, exserted, about as long as the corolla-lips; anthers 1-celled, muticous; pollen globose, echinate (stachelpollen), or more often nearly smooth with most minute points. Ovary and style glabrous; stigma nearly capitate; ovules 2 in each cell. Capsule small, oblong, shortly stalked, normally 4-seeded. Seeds rugose, without hairs.—Herbaceous (as noted) up to 5 feet. Leaves entire or nearly so. Spikes, or oblong panicles, with many flowers, terminal or axillary, more or less hairy; outer bracts (floral leaves) prominent, imbricate, or narrow, or (in panicles) small, linear; inner bracts (or bracteoles) small, linear, or 0.

Species 8, viz. the 6 here described with 2 in Madagascar.

In this genus, as Lindau hints, the pollen is 3-banded in *B. longiflorus*, Lindau; in other species minutely echinulate, more obscurely banded (always with 3 stopples).

Spikes elongate, close; floral leaves more or less imbricate.

Floral leaves obovate or elliptic, glabrate 1. *B. africanus.*

Floral leaves narrow-oblong, ciliate 2. *B. Holstii.*

Panicle condensed, linear; flowers scarcely pedicelled.

Floral leaves lanceolate 3. *B. longiflorus.*

Floral leaves linear 4. *B. jaundensis.*

Flowers paniced; flowers pedicelled; floral leaves and bracts minute.

Panicle lax; sepals $\frac{1}{8}$ – $\frac{1}{6}$ in. long, glabrate 5. *B. occidentalis.*

Panicle cylindric; sepals $\frac{1}{3}$ in. long, viscid-pubescent 6. *B. Mannii.*

1. **B. africanus**, *S. Moore in Trans. Linn. Soc. ser. 2, Bot. iv. 31.* Nearly glabrous. Leaves up to $6\frac{1}{2}$ by 2 in., tapering at both ends; cystoliths small, numerous on the lower surface; petiole $\frac{1}{4}$ –2 in. long. Spikes up to 7 by $\frac{1}{3}$ in., strobilate; floral leaves $\frac{1}{2}$ by $\frac{1}{4}$ in., obovate, acuminate, upper 1-flowered, lower with 3–2 perfect or imperfect flowers; bracteoles $\frac{1}{4}$ in. long, linear-lanceolate. Sepals 5, subequal, $\frac{1}{3}$ – $\frac{1}{2}$ in. long, linear, with cystoliths, glabrous, or with a very few short-stalked glands on the margin. Corolla-tube $\frac{3}{4}$ in. long, linear; lips

$\frac{1}{3}$ – $\frac{1}{2}$ in. long, elliptic. Filaments $\frac{1}{2}$ in. long, exserted; anthers $\frac{1}{10}$ in. long, glabrous; pollen globose, slightly 3-angled, most minutely echinulate, with 3 stopples. Ovary oblong, glabrous; disc short; style of genus.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344, and in Engl. Pfl. Ost-Afr. C. 372.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, 6000 ft., Whyte, 56!

This plant illustrates the illusory nature of the distinction between bracteoles (*vorblaetter*) and bract (*deckblatt*). If a "bract" from the upper part of the spike be taken off, the 2 lateral green bracteoles are seen in their regular position; but if a lower floral leaf be taken off, a growth from one or both the bracteoles is seen, the bracteole is broader and indicates an approach in shape to that of the deckblatt, and may support a perfect flower.

2. **B. Holstii**, Lindau in Engl. Jahrb. xx. 53. Branchlets minutely pubescent. Leaves up to 4 by 2 in., narrowed at both ends, minutely pubescent beneath, at least on the midrib; petiole up to $\frac{3}{4}$ in. long. Spikes $2\frac{1}{4}$ by $\frac{1}{3}$ in., dense or interrupted, scarcely strobilate; bracts $\frac{1}{2}$ in. long, narrow-lanceolate, ciliate. Sepals $\frac{1}{3}$ in. long, linear-oblong, ciliate. Corolla crimson; tube $\frac{2}{3}$ in. long; lips nearly $\frac{1}{2}$ in. long, elliptic. Filaments $\frac{1}{3}$ in. long, exserted; pollen globose, echinate. Pistil of the genus.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344, and in Engl. Pfl. Ost-Afr. C. 372.

Mozamb. Dist. German East Africa: Kilimanjaro; Marangu, 7000 ft., Volkens, 838! Johnston, 1! Usambara; Magamba Mountain, Holst, 3811!

This is allied to *B. Lyallii*, Nees, from Madagascar; but has a much shorter corolla-tube.

3. **B. longiflorus**, Lindau in Engl. Jahrb. xx. 53. Stem 3 ft. high, minutely pubescent. Leaves up to $5\frac{1}{2}$ by $2\frac{1}{4}$ in., narrowed at both ends, minutely and sparsely bristly on both surfaces; petiole $\frac{1}{4}$ – $1\frac{1}{2}$ in. long. Panicles up to 3 by $\frac{3}{4}$ in., of very dense contracted cymes, with many-celled hairs of which the alternate cells are thicker; floral leaves $\frac{1}{2}$ by $\frac{1}{10}$ – $\frac{1}{8}$ in., narrow-lanceolate. Sepals exceeding $\frac{1}{2}$ in. in length, linear-subulate, hairy as the bract. Corolla purple; tube $\frac{3}{4}$ –1 in. long; lips $\frac{1}{3}$ in. long, subentire. Anthers exserted $\frac{1}{4}$ in.; pollen globose, slightly trigonous, 3-banded, smooth or very nearly so. Pistil of the genus. Capsule $\frac{1}{2}$ in. long, 4-seeded.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344.

Upper Guinea. Cameroons: Buea, 5500 ft., Preuss, 890! 846! Fernando Po, 3000 ft., Mann, 589!

4. **B. jaundensis**, Lindau in Engl. Jahrb. xxii. 125. Stem 2–5 ft. high, sparingly pubescent. Leaves up to 4 by $1\frac{1}{2}$ in., narrowed at both ends, puberulous or glabrate; cystoliths inconspicuous; petiole up to $\frac{1}{2}$ in. long. Spike (condensed panicle) terminal or on a short axillary branch, 1–3 by $\frac{1}{2}$ in.; bract and bracteoles $\frac{1}{4}$ in. long, linear, hispid-pubescent. Sepals $\frac{1}{2}$ in. long, linear, hairy. Corolla light purple; tube 1– $1\frac{1}{2}$ in. long, sparsely hairy without; lips $\frac{1}{3}$ in. long, subentire.

Anthers $\frac{1}{3}$ – $\frac{1}{2}$ in. exserted; pollen globose, slightly trigonous, obscurely 3-banded, minutely tubercled.—*B. yaundensis*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344.

Upper Guinea. Cameroons: Yaunde, *Zenker & Staudt*, 312! Lolodorf, *Staudt*, 374! Efulen, *Bates*, 246.

5. **B. occidentalis**, Lindau in Engl. Jahrb. xx. 53. Stem 6 ft. high, nearly glabrous. Leaves $5\frac{1}{2}$ by $2\frac{1}{2}$ in., narrowed at both ends, when mature glabrate above, minutely hairy beneath; cystoliths many, small; petiole $\frac{1}{4}$ –1 in. long. Panicles $3\frac{1}{4}$ by $1\frac{1}{4}$ in. long, lax, minutely pubescent; lower branches evolute into zigzag racemes; flowers solitary; bract scarcely $\frac{1}{8}$ in. long, linear. Sepals $\frac{1}{8}$ – $\frac{1}{6}$ in. long, linear, nearly glabrous. Corolla-tube $\frac{3}{4}$ in. long; lips $\frac{1}{4}$ in. long, slightly notched. Pollen globose, strongly echinate. Pistil of the genus.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344.

Lower Guinea. Isle of St. Thomas, 2000 ft., *Mann*, 1096! *Quintas*, 91! *Welwitsch*, 5208! *Moller*, 16!

6. **B. (?) Mannii**, C. B. Clarke. Stem 2–3 ft. high. Leaves $6\frac{1}{4}$ by $2\frac{1}{4}$ in., obovate-lanceolate, attenuate at both ends, nearly glabrous; cystoliths scattered on the under surface and along the nerves on the upper surface; petiole up to $\frac{3}{4}$ in. long; main nerves subparallel, 10 on each side the midrib. Panicle terminal, 3 by $\frac{2}{3}$ in., viscid-pubescent; flowers solitary, the lower on short zigzag racemes; bracts $\frac{1}{4}$ in. long, linear. Sepals $\frac{1}{3}$ in. long and upwards, linear, viscid-pubescent. Corolla purple; tube $\frac{3}{4}$ in. long, linear. Filaments 2, long exserted, glabrous; pollen globose, most minutely tubercled. Pistil glabrous; ovary oblong; stigma subcapitate; disc small.

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1666!

Anthers not seen; hence the genus is not certain.

43. **JUSTICIA**, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1108.

Calyx (small or medium) divided nearly to the base; segments 5 (or very rarely 4), linear or linear-lanceolate. Corolla 2-lipped, nearly always hairy without; tube not (or scarcely) longer than the limb; anticous lip 3-lobed; posticous lip entire or shortly 2-lobed; palate often marked by spots or transverse wrinkles. Stamens 2; one anther-cell distinctly below the other, definitely tailed; pollen ellipsoid, with 2 or 3 longitudinal smooth areas containing stopples, continued to the pole or not, with longitudinal rows of tubercles often reduced to granular patches or obsolete. Ovary with 2 (or 1) ovules in each cell; style linear, usually more or less hairy in the lower half; branches 2, minute, subequal. Capsule 4-seeded; stalk solid, usually short, not slender; placenta not rising from the base elastically; seeds rough or tubercular, rarely hairy. In *J. heterocarpa*, and a few allied species, besides the normal 4-seeded capsule there occur 1-seeded dimorphic,

spinous-winged capsules.—Herbs or shrubs. Leaves entire or obscurely wavy-crenate. Flowers small or medium-sized, purple-yellow or white, in spikes (strobilate or loose, or interrupted below), terminal or axillary, or in axillary clusters, or solitary, or in slender loose axillary spikes, or in panicles, or in reduced (often paniced) cymes; floral leaves broad, imbricated (as in strobilate spikes), or narrow, long, or small; bracts long elliptic, or narrow small, or 0.

Species 200; throughout all warm regions.

***BETONICA.**—Spikes strobilate; floral leaves ovate, often somewhat 4-ranked. Sepals 5, except in 11. *J. tenella*. Pollen hardly tubercled.

Floral leaves white reticulated with green or purple veins. Capsule hairy. (Species 1–7 are all one in the opinion of T. Anderson and of S. Moore.)

Floral leaves reticulated with green veins.

Petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. long 1. *J. Betonica*.

Petiole 0– $\frac{1}{8}$ in. long.

Leaves softly hairy beneath.

Leaves up to 3 in. long 2. *J. betonicoides*.

Leaves $\frac{2}{3}$ – $\frac{3}{4}$ in. long 5. *J. ruwenzoriensis*.

Leaves nearly glabrous.

Leaves $2\frac{1}{2}$ in. long 6. *J. andongensis*.

Leaves $1\frac{1}{2}$ in. long 4. *J. trinervis*.

Leaves $\frac{3}{4}$ in. long 3. *J. nilgherrensis*.

Floral leaves reticulated with purple veins 7. *J. versicolor*.

Floral leaves not white, reticulate-veined.

Sepals 5.

Leaves up to 7 in. long; floral leaves $\frac{2}{3}$ in. long, white margined 8. *J. Pseudorungia*.

Leaves up to $3\frac{1}{2}$ in. long; floral leaves $\frac{1}{4}$ – $\frac{1}{3}$ in. long 9. *J. paucinervis*.

Leaves up to 1 in. long, round 10. *J. Emini*.

Sepals 4; floral leaves $\frac{1}{6}$ in. long 11. *J. tenella*.

****ROSTELLULARIA.**—Flowers in terminal spikes, hardly strobilate, more or less interrupted at the base; floral leaves narrower than in subgenus *Betonica*, upper imbricated. Flowers 1–3 under each floral leaf, which becomes the “proper bract” when there is only 1 flower under it.

Sepals 5 (in a few species the posticous sepal much smaller than the others), not conspicuously white-margined.

Floral leaves ovate or elliptic (see also 21. *J. nyassana*).

[Species in this group of which the fruit is unknown may turn out to be of the genus *Monechma*.]

Corolla $\frac{2}{3}$ in. long or more.

Flowers 3–2 under each floral leaf 12. *J. phyllostachys*.

Flowers 1 under each floral leaf (bract).

Leaves acuminate; ovary glabrous 13. *J. læta*.

Leaves subotuse; ovary shaggy 14. *J. simplicispica*.

Corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long.

Leaves 5 in. in diam., very long petioled, cordate 15. *J. fittonioides*.

Leaves $\frac{2}{3}$ in. long; floral leaves orbicular 16. *J. mossambicensis*.

- Leaves $\frac{1}{2}$ in. long; floral leaves narrowly elliptic . 17. *J. baravensis*.
 Floral leaves linear-oblong or linear (small narrow-elliptic in 21, *J. nyassana*).
 Sepals $\frac{1}{10}$ — $\frac{1}{5}$ in. long, linear-lanceolate or linear.
 Capsule soft with many minute deflexed hairs.
 Spikes $\frac{3}{4}$ in. broad.
 Bracts and bracteoles without linear yellow-hairy tips.
 Leaves ovate to elliptic.
 Sepals hispid, and also with minute moniliform hairs 18. *J. flava*.
 Sepals hispid, but with no moniliform hairs 19. *J. palustris*.
 Leaves lanceolate to linear 20. *J. kirkiana*.
 Bracts and bracteoles with linear yellow-hairy tips 21. *J. nyassana*.
 Spikes $\frac{1}{4}$ in. broad 22. *J. linearispica*.
 Capsule (as ovary also) quite glabrous.
 Spikes continuous or nearly so.
 Petiole 0— $\frac{1}{4}$ in. 23. *J. longecalcarata*.
 Petiole $\frac{1}{2}$ —1 in. 24. *J. tanaensis*.
 Spikes more or less interrupted at the base.
 Spike linear-oblong, somewhat interrupted . 25. *J. aridicola*.
 Spike long-linear, much interrupted 26. *J. stachytarphetoides*.
 Sepals $\frac{2}{5}$ in. long, conspicuously white-margined.
 Leaves sessile; corolla $\frac{2}{3}$ in. 27. *J. togoensis*.
 Leaves petioled; corolla 1 in. 28. *J. ulugurica*.
 Sepals 4, subequal, small, with very small flowers . . 29. *J. diffusa*.

***CALOPHANOIDES.—Flowers axillary, sessile, clustered or solitary; uppermost clusters hardly confluent into a spike.

†Branches herbaceous, internodes long. Leaves more or less hairy. Flowers mostly 4 or 2 in each cluster under one floral leaf with minute (or no) bracts, though solitary flowers also occur. All the capsules seen in this group normal, 4-seeded, exceeding $\frac{1}{4}$ in. long. [Species 30–34 of this group, together with 37, may be treated as one (for which composite species T. Anderson devised the name *J. neglecta*); Oliver accepted this view, but kept 35. *J. dyschoristeoides* distinct.]

Capsule glabrous; style-base usually hairy, and sometimes tip of capsule slightly hairy.

Sepal-tips lanceolate, or subobtuse shortly linear-tipped.

- Leaves dark green, lower long-petioled 30. *J. insularis*.
 Leaves pale green, short-petioled 31. *J. calcarata*.

Sepal-tips linear, acute, hispid.

Leaves 1–3 in. long.

- Sepals $\frac{1}{4}$ in. long; corolla $\frac{1}{2}$ in. long 32. *J. Galeopsis*.
 Sepals $\frac{1}{3}$ in. long; corolla less than $\frac{1}{3}$ in. long . . . 33. *J. Lazarus*.
 Sepals $\frac{1}{2}$ in. long.
 Corolla $\frac{3}{4}$ –1 in. long, tube narrow 34. *J. leikipiensis*.
 Corolla $\frac{1}{2}$ in. long, tube broad 36. *J. pinguior*.

- Leaves $\frac{3}{4}$ in. long, very glabrous 35. *J. dyschoristeoides*.
 Capsule hairy.
 Leaves oblong, scabrid hairy 37. *J. sexangularis*.
 Leaves lanceolate to linear, glabrate 38. *J. filifolia*.
 Leaves ovate to lanceolate, hairy 39. *J. Whytei*.

†† *Harnieria*. — Branches herbaceous; internodes long. Leaves more or less hairy. Flowers several or one in a cluster. Capsules normal, 4-seeded; and also (often mixed therewith in the same cluster) abnormal, ovoid, subpyramidal, 1-seeded capsules, with strongly toothed wings.—N.B. In *J. Mollugo*, *J. shebelensis*, *J. heterocarpa*, var. β , and in *J. leptocarpa* no abnormal capsules have been seen, and the plants may prove to belong to groups † or †††. Further, the typical dimorphic-fruited *J. Melampyrum* was esteemed by Oliver to be possibly only a seasonal form of *J. insularis*, T. Anders. in group †.

Flowers $\frac{1}{3}$ in. long at least. Normal capsules more than $\frac{1}{4}$ in. long.

- Lower leaves ovate-lanceolate, base acute 40. *J. Melampyrum*.
 Lower leaves long-petioled, base rounded 41. *J. Lindau*.
 Leaves $\frac{1}{2}$ in. long, obovate, subsessile 42. *J. shebelensis*.

Flowers scarcely $\frac{1}{4}$ in. long. Normal capsules less than $\frac{1}{4}$ in. long.

Lower leaves ovate-lanceolate. Flowers sessile.

- Sepals $\frac{1}{8}$ in. long. Normal capsules $\frac{1}{8}$ – $\frac{1}{6}$ in. long 43. *J. heterocarpa*.
 Sepals $\frac{1}{6}$ in. long. Capsule $\frac{1}{6}$ in. long 44. *J. leptocarpa*.
 Lower leaves oblong-elliptic. Flowers subcymulose 45. *J. Mollugo*.

††† Flowers scattered, many solitary, or axillary on short pedicels; but clusters of 3–1 flowers frequently occur. [These form a badly-limited group, placed with *Gendarussa* by T. Anderson and Bentham. I do not see any particular affinity between *J. Gendarussa* and *J. odora* (the "type" of the present group), but I have no great improvement in the arrangement to propose.]

Mature leaves glabrous; in *J. Fischeri* sometimes with a few bristles on the margins. [Corolla $\frac{1}{2}$ – $\frac{2}{3}$ in. long. Capsule glabrous.]

- Leaves linear; capsule $\frac{2}{3}$ in. long 46. *J. Lortea*.
 Leaves ovate or oblong; capsule hardly $\frac{1}{2}$ in. long.
 Leaves hardly $\frac{1}{2}$ in. long; corolla purple 47. *J. Phillipsia*.
 Leaves exceeding $\frac{1}{2}$ in. long; corolla (where known) yellow.
 Leaves obtuse.
 Nerves obscure 48. *J. odora*.
 Nerves distinct 49. *J. sansibarensis*.
 Leaves apiculate 50. *J. Fischeri*.

Mature leaves (often minutely or thinly) hairy.

- Species of West Africa (leaves $\frac{3}{4}$ in. long; corolla violet). 51. *J. brevicaulis*.

Species of East Africa.

Capsule glabrous.

- Leaves $\frac{1}{2}$ in. long; corolla $\frac{1}{3}$ in. long 52. *J. microphylla*.

Leaves 1 in. long; corolla $\frac{3}{4}$ in. long . . . 53. *J. gesnerifolia*.
 Capsule hairy.

Leaves 1 in. long; corolla about $\frac{1}{2}$ in. long . 54. *J. diclipteroides*.

Leaves $\frac{1}{5}$ – $\frac{1}{3}$ in. long; corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long . 55. *J. urbaniana*.

****GENDARUSSA. — Panicle terminal, or the axillary cymes running into an elongate terminal quasi-panicle. Bracts linear, shorter than the calyx, inconspicuous; floral leaves (if any) remote from the calyx, at the principal divisions of the panicle. [N.B. There is no essential difference between the inflorescence of a species such as *J. cordata* and that of subgenus *Rostellularia*; the primary branches of the "panicle" carrying small clusters of flowers at their tops are altogether homologous with the lateral branches carrying short terminal spikes in *Rostellularia*; the tangible difference is that in the subgenus *Gendarussa* the bracts are narrow, not longer than the calyx.]

Panicle linear, nearly continuous (a very glabrous shrub) 56. *J. Gendarussa*.

Panicle more lax, with the lateral cymes more or less evolute.

Flowers 1 in. long or more.

Corolla very deeply 2-lipped.

Ovary glabrous; leaves nearly glabrous . . . 57. *J. Rendlei*.

Ovary and capsule hairy.

Leaves up to 5 in. long, sparsely pubescent . 58. *J. Preussii*.

Leaves $1\frac{1}{3}$ in. long; pubescence brown-glandular 59. *J. salviiflora*.

Leaves $\frac{2}{3}$ in. long, minutely densely grey-hairy 60. *J. grisea*.

Corolla-tube much longer than the lips 61. *J. belerophonoides*.

Flowers $\frac{1}{2}$ – $\frac{3}{4}$ in. long.

Panicle branches divaricate or recurved; flowers solitary.

Ovary and capsule glabrous.

Panicle oblong; floral leaves often large, ovate 62. *J. laxa*.

Panicle linear; floral leaves small, linear . 63. *J. pyramidata*.

Ovary and capsule hairy 64. *J. extensa*.

Panicle branches oblique, erect, with a cluster of 3–1 flowers at the top.

Branches and leaves glabrous 65. *J. cordata*.

Branches and leaves hairy 66. *J. piloso-cordata*.

Panicle branches of short 1-sided spikes; flowers solitary 67. *J. masaiensis*.

Panicle compound; floral leaves 0 or minute; flowers in small distant sessile clusters 68. *J. interrupta*.

Panicle compound with capillary branches; flowers solitary 69. *J. glabra*.

*****ANSELLIA.—Spikes axillary, weak, unilateral, with few distant solitary flowers. Corolla small. Capsule small, ellipsoid, short-stalked, 4-seeded, very thin in texture; seeds strongly rugose. These plants form a small, distinct, closely-allied group, and appear to me related to some American species of *Dianthera* (as *D. ovata*,

Walt., *Rhytiglossa humilis*, Nees); but in *Ansellia* the tail of the lower anther is well developed, so that the group *Ansellia* cannot be united with *Dianthera* unless, with Lindau, the unmanageably long series of species of *Justicia* be increased by sinking *Dianthera* altogether in it. Lindau assigns these species of sect. *Ansellia* as "typical" examples of his section *Rostellaria* (characterised by Lindau as having flowers in dense spikes). The sect. *Ansellia*, as intimated by T. Anderson, is possibly best dealt with by making it a separate genus.

Spikes usually with more than 2 flowers.

Corolla about $\frac{1}{4}$ in. long. (These three species in the arrangement of Lindau are but one.)

Nearly glabrous. Leaves oblong or linear	70. <i>J. anselliana</i> .
Pilose. Leaves 2-3 in. long	71. <i>J. matammensis</i> .
Pilose or pubescent. Leaves $\frac{1}{2}$ - $\frac{2}{3}$ in. long	72. <i>J. uncinulata</i> .
Corolla $\frac{1}{2}$ in. long or nearly so	73. <i>J. crassiradix</i> .
Spikes 2-flowered; leaves subsessile, base truncate	74. <i>J. Nuttii</i> .

1. **J. Betonica**, Linn. *Sp. Plant.* 21. Shrubby, nearly glabrous. Leaves 3 by $1\frac{1}{3}$ in., ovate, acuminate, shortly acuminate at the base; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Spikes $4\frac{1}{2}$ by $\frac{3}{4}$ in. long, strobilate; bracts somewhat 4-ranked, $\frac{1}{2}$ by $\frac{1}{3}$ in., ovate, acute, white green-nerved; bracteoles $\frac{1}{3}$ by $\frac{1}{4}$ in., similar to the bracts. Sepals $\frac{1}{6}$ in. long, linear, pubescent. Corolla $\frac{1}{2}$ in. long, white, rose-spotted. Filaments glabrous, dilated at the top; one anther-cell below the other, very long-tailed; pollen ellipsoid with 2 stopples, the longitudinal band passing completely round the grain, with one row of patches on each side of each stopple. Pistil nearly glabrous. Capsule $\frac{1}{2}$ by $\frac{1}{5}$ in., retrorsely hairy, 4-seeded; stalk $\frac{1}{8}$ in. long, solid, stout; seeds rugose.—T. Anders. in Journ. Linn. Soc. vii. 38; C. B. Clarke in Hook. f. *Fl. Brit. Ind.* iv. 525. *Adhatoda Betonica*, Nees in Wall. *Pl. As. Rar.* iii. 103, and in DC. *Prod.* xi. 385. *Nicoteba Betonica*, Lindau in Engl. *Jahrb.* xviii. 56, 63, t. 2, fig. 56, and in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 329, and in Engl. *Pfl. Ost-Afr.* C. 370.—Rheede, *Hort. Malabar.* ii. t. 21.

Upper Guinea. Sierra Leone (ex Lindau).

Lower Guinea. Angola and Damaraland (ex Lindau).

Nile Land. Abyssinia: Kordofan, (ex Lindau).

Mozamb. Dist. Portuguese East Africa: Gorongoza, *Carvalho!*

No example that matches at all closely the ovate-leaved *J. Betonica*, Linn. (type, Rheede, *Hort. Malab.* ii. t. 21), has been seen by me from Africa except Carvalho's; and the above distribution is given on the authority of Lindau, who possibly (as T. Anderson) considered several of the succeeding species as mere varieties of *J. Betonica*. But Lindau admits *Nicoteba nilgherrensis* and *N. versicolor* as species.

This species also occurs in India and Malaya.

2. **J. betonicoides**, C. B. Clarke. Leaves 3 by $\frac{1}{2}$ - $\frac{2}{3}$ in., oblong or lanceolate, hairy beneath and on the nerves above, subsessile. Style rather densely hairy; otherwise as *J. Betonica*.

Nile Land. British East Africa: Jur; Jur Ghattas, *Schweinfurth*, 1423! Mittu, *Schweinfurth*, 2793! Bongo, *Schweinfurth*, 2543! along Gilgil River, north of Lake Naivasha, 6000–7000 ft., *Scott-Elliott*, 6647!

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte*!

The plants here collected do not match exactly. In *Scott-Elliott*, 6647, the bracts are more than $\frac{1}{2}$ in. long, very white scarious; in *Schweinfurth*, 1423, the stems are very hairy, the bracts more than $\frac{1}{2}$ in. long, mucronate; in other examples the bracts are $\frac{1}{4}$ – $\frac{1}{3}$ in. long, green.

3. ***J. nilgherrensis***, *Wall. Cat.* 2435. Small, procumbent, nearly glabrous. Leaves $\frac{3}{4}$ by $\frac{1}{6}$ in., lanceolate, sessile. Bracts $\frac{1}{2}$ by $\frac{1}{4}$ in., greenish-white, green-veined; bracteoles $\frac{1}{3}$ in. long, lanceolate. Filaments glabrous, except close to their point of attachment; otherwise as *J. Betonica*.—C. B. Clarke in *Hook. f. Fl. Brit. Ind.* iv. 526; S. Moore in *Journ. Bot.* 1880, 309, partly. *Adhatoda nilgherrica*, Nees in *DC. Prod.* xi. 386; Wight, *Ic. t.* 1544. *Nicoteba nilgherrensis*, Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 329.

Lower Guinea. Angola: Huilla, *Welwitsch*, 5043!

This specimen has acute leaves and laxer spikes than in the South Indian *J. nilgherrensis*.

4. ***J. trinervia***, *Vahl, Enum.* i. 156. Small, procumbent, nearly glabrous. Leaves $1\frac{1}{2}$ by $\frac{1}{3}$ in., oblong-elliptic, obtuse, sessile. Spikes $1\frac{1}{2}$ by $\frac{1}{2}$ in., flexuose; bracts $\frac{1}{4}$ – $\frac{1}{3}$ in. long, ovate, acute, green-veined. Flowers rather smaller than those of *J. Betonica*.—C. B. Clarke in *Hook. f. Fl. Brit. Ind.* iv. 526. *J. Betonica*, T. Anders. in *Journ. Linn. Soc.* ix. 510. *Adhatoda trinervia*, Nees in *DC. Prod.* xi. 386. *A. variegata*, Nees in *DC. Prod.* xi. 385; A. Rich. *Tent. Fl. Abyss.* ii. 154; Solms-Laub. in *Schweinf. Beitr. Fl. Aethiop.* 104. *Nicoteba trinervia*, Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 329. *Gendarussa variegata*, Hochst. ex Nees in *DC. Prod.* xi. 385.

Nile Land. Abyssinia: Sana; on dry hills near Dochli, *Schimper*, 516!

Also in Southern India.

5. ***J. ruwenzoriensis***, *C. B. Clarke*. Stems 8 in. long, with patent white hairs. Leaves $\frac{2}{3}$ – $\frac{3}{4}$ in. in diam., ovate or round, softly hairy beneath; petiole hardly any. Spikes 2 by $\frac{1}{3}$ – $\frac{1}{2}$ in.; bracts $\frac{1}{4}$ in. long, ovate or obovate, scarcely acute, hairy, green-nerved. Corolla as of *J. Betonica*, but rather smaller. Filaments glabrous; pollen with 3 large stopples. Ovary hairy; lower part of the style very hairy; otherwise as *J. Betonica*.

Mozamb. Dist. German East Africa: Karagwe, on dry hills, 4000–5000 ft., *Scott-Elliott*, 3120!

Possibly another variety of *J. Betonica*.

6. ***J. andongensis***, *C. B. Clarke*. Branches 18 in. long, with two hairy lines. Leaves $2\frac{1}{2}$ by $\frac{3}{4}$ in., cuneate-triangular at either end, glabrous or minutely hairy on the nerves beneath; petiole 0 – $\frac{1}{8}$ in. long. Spikes, flowers and bracts nearly as of *J. Betonica*, Linn. Fila-

ments glabrous; pollen with 3 stopples. Style hairy.—*J. Betonica*, S. Moore in Journ. Linn. Soc. xviii. 309, partly.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5111! Malange, *Pogge*, 301! Amboland, *Schinz*, 36!

The leaves of this plant, which are subsessile with both ends nearly alike, do not agree with the Indian *J. Betonica*. But this may be a form of *J. nilgherrensis* (*Welwitsch*, 5043), as S. Moore took it to be.

7. ***J. versicolor***, *C. B. Clarke*. Woody shrub; branches and innovations densely and minutely grey-hairy. Leaves $2\frac{1}{2}$ by $\frac{3}{4}$ in., oblong-elliptic, obtuse, when mature nearly glabrous; petiole $0-\frac{1}{8}$ in. long. Spikes terminal, 3 by $1\frac{1}{4}$ in.; floral leaves $\frac{3}{4}$ by $\frac{1}{5}$ in., narrowly elliptic, obtuse, loosely imbricate, coloured, purplish-veined. Sepals 5, $\frac{1}{4}$ in. long, equal, narrow-lanceolate, 3-nerved, minutely hairy. Corolla $\frac{3}{4}-1$ in. long, pale-violet; tube very short; posticous lip subentire. One anther-cell below the other, spurred; pollen ellipsoid; stopples 3, bands reaching the poles, with rows of patches not of tubercles. Capsule nearly 1 in. long, densely shortly hairy, 4-seeded; stalk short, thick, solid; placentæ not rising elastically; seeds irregularly tuberculate.—*Nicoteba versicolor*, Lindau in Engl. Jahrb. xxii. 118.

Lower Guinea. Angola: Huilla, *Welwitsch*, 5049! Humpata, *Newton*, 117! No specimen at Kew.

8. ***J. Pseudorungia***, *Lindau in Engl. Jahrb.* xx. 63. Under-shrub, 3 ft. high, very slightly hairy. Leaves up to 7 by $2\frac{1}{2}$ in., acuminate at either end, margin wavy; petiole up to 1 in. long, but often 0 (the wing from leaf-base being elongate). Spikes 4 by $\frac{3}{4}$ in., strobilate; bracts $\frac{2}{5}$ by $\frac{1}{3}$ in., with a white scarious margin; bracteoles $\frac{2}{5}$ by $\frac{1}{5}$ in., similar. Sepals 5, $\frac{1}{4}-\frac{1}{3}$ in. long, minutely hairy. Corolla $\frac{1}{2}$ in. long, white; filaments glabrous; one anther-cell below the other, tailed; pollen ellipsoid, with 2 stopples, and one row of circular patches on each side of each stopple. Pistil glabrous. Capsule $\frac{1}{3}-\frac{1}{2}$ in. long, glabrous, 4-seeded; seeds rugose; valves not rising elastically.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 374.

Nile Land. British East Africa: Nyika country near Mombasa, *Wakefield*!

Mozamb. Dist. Zanzibar, *Hildebrandt*, 982! German East Africa: Usambara; Mascheua, *Holst*, 8801! Kilimanjaro, 7000 ft., *Johnston*, 164! Ulugura, *Stuhlmann*, 9037!

9. ***J. paucinervia***, *T. Anders. MS.* Stems simple, 8–12 in. long; innovations rusty with moniliform brown hairs. Leaves $3\frac{1}{2}$ by 1–2 in., oblong or ovate, narrowed at either end, nearly glabrous except the nerves; cystoliths numerous on both faces; petiole $\frac{1}{2}-1\frac{3}{4}$ in. long. Spikes terminal, 2 by $\frac{1}{2}$ in., very loose, obscurely strobilate; bracts $\frac{1}{4}-\frac{1}{3}$ in. long; obovate, veined, fimbriate, almost lobed at the top, brown-ciliate, scarcely imbricate; bracteoles 0. Sepals 5, scarcely $\frac{1}{8}$ in. long, linear, hairy. Corolla $\frac{1}{3}$ in. long. Filaments glabrous; one anther-cell below the other, tailed; pollen ellipsoid, with 2 longitudinal bands and

stopples, no tubercles. Ovary nearly glabrous; style-base somewhat hairy.

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1672!

The stem and leaves of this species are unlike those of any other *Justicia*, but simulate those of *Distichocalyx angustifolia*, *D. polyneura*, &c., which grow at the same place.

10. **J. Emini**, *Lindau in Engl. Jahrb.* xx. 68. Hairy. Upper leaves 1 in. long, ovate, subsessile; lower 2–3 in. long, narrowed at the base into a petiole $\frac{1}{4}$ in. long. Spike terminal, somewhat interrupted at the base; bracts round; flowers solitary; bracteoles very small. Sepals 5, equal, $\frac{1}{5}$ in. long, linear, hairy. One anther-cell below the other, tailed; stopples 2; one row of obscure patches on either side each stopple. Ovary glabrous; style-base hairy.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349, and in *Engl. Pfl. Ost-Afr.* C. 373.

Nile Land. British East Africa: Mpororo; Ruhanda, *Stuhlmann*, 2086!

The locality is quoted as Rubanga by Lindau, but this is clearly an error, as, according to Stuhlmann, Rubanga is the name of a Deity only.

Lindau separates *Nicoteba* (i.e. *J. Betonica*) from *Justicia* by the pollen only, which is said to be "banded" in *Nicoteba*, "tubercled" in *Justicia*. The pollen is essentially the same in the two genera; but the longitudinal row of tubercles on either side the stopple in *Justicia* is "obsolete" or depressed into circular granular patches in *Nicoteba*. As to the present species, however, placed by Lindau in *Justicia*, the tubercles are not more strongly indicated than they are in many species of *Nicoteba*.

11. **J. tenella**, *T. Anders. in Journ. Linn. Soc.* vii. 40. Slender, 4–12 in. long, nearly glabrous. Leaves up to 1 by $\frac{3}{4}$ in., ovate, tip obtuse, triangular, base slightly decurrent; petiole $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Spikes $\frac{1}{4}$ –1 by $\frac{1}{5}$ in., very dense, strobilate. Peduncles $\frac{1}{3}$ – $1\frac{1}{2}$ in. long, axillary, 2–6 together; floral leaves somewhat 4-ranked, $\frac{1}{6}$ in. in diam., nearly round; bract $\frac{1}{8}$ – $\frac{1}{10}$ in. long, lanceolate; bracteoles similar, rather smaller. Sepals 4, $\frac{1}{16}$ in. long, obtuse, minutely pubescent. Corolla $\frac{1}{5}$ in. long, bluish-white. Stamens 2; anther-cells ellipsoid, one below the other tailed; pollen very small, ellipsoid, with 3 stopples and longitudinal bands reaching the poles, but no tubercles. Capsule $\frac{1}{8}$ in. long, 4-seeded, glabrous; stalk $\frac{1}{16}$ in. long, solid; placentæ not rising elastically; seeds smooth, with very short hairs on all sides.—*Lindau in Bolet. Soc. Brot.* x. 147. *Rostellaria tenella*, Nees in DC. Prod. xi. 369; Benth. in Hook. Niger Fl. 482. *R. crenulata*, Nees in DC. Prod. xi. 369. *R. parviflora*, Benth. in Hook. Niger Fl. 481. *Etheilema rupestre*, Nees in DC. Prod. xi. 262. *Micranthus rupestris*, O. Kuntze, Rev. Gen. 493; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 298. *Rungia Baumannii*, Lindau in Engl. Jahrb. xxii. 120. *Anisostachya tenella*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 329, fig. 132, E–G. *Phaulopsis rupestris*, Lindau in Engl. & Prantl, Pflanzenfam. Nachtr. zu ii.–iv. 305.

Upper Guinea. Senegambia, *Heudelot*, 327! Sierra Leone: Lester Peak, *Scott-Elliot*, 3851! and without precise locality, *Afzelius!* *Rattray!* Togoland, 1600 ft., *Baumann*, 221! *Büttner*, 185! Cameroons: Rio del Rey, *Johnston!* Efulen, *Bates*, 272! Yaunde, *Zenker*, 299!

Lower Guinea. Princes Island, *Barter*, 1985! Island of St. Thomas, *Don!* *Welwitsch*, 5200! *Moller!* Gaboon: Sierra del Crystal, *Mann*, 1690!

Mozamb. Dist. German East Africa: Usaramo, *Stuhlmann*, 8695! Uluguru, *Stuhlmann*, 8994!

12. ***J. phyllostachys***, *C. B. Clarke*. Hairy; branches 2 ft. long, angular, dividing. Leaves up to 4 by $1\frac{2}{3}$ in., narrowed at both ends; petiole $1\frac{1}{2}$ in. long. Spikes up to $2\frac{1}{2}$ by 1 in., dense; floral leaves $\frac{2}{3}$ by $\frac{1}{4}$ in., acute (but the lower are often 1 in. long, approximating to ordinary leaves, so that the inflorescence appears leafy), with 3-1 flowers under each; bracteoles 2, minute. Sepals 5, subequal, $\frac{1}{6}$ in. long, linear-lanceolate. Corolla up to $\frac{3}{4}$ in. long; tube linear-cylindric; very little inflated upwards; lips scarcely $\frac{1}{4}$ in. long, posticous oblong-elliptic, subentire. One anther-cell below the other, tailed; pollen ellipsoid, with 2 stopples and several rows of tubercles on the bands. Pistil glabrous except a few scattered hairs on the style. Capsule $\frac{1}{5}$ in. long; 4-seeded, glabrous; stalk solid, less than $\frac{1}{12}$ in. long; placentæ not rising elastically; surface of seeds irregularly corrugate.

Lower Guinea. Angola: Cunene River, *Johnston!*

Mozamb. Dist. Nyasaland; between Mpata and Tanganyika Plateau, 2000-3000 ft., *Whyte!* Nyika Plateau, 6000-7000 ft., *Whyte*, 118! Mount Chiradzulu, 4000 ft., *Whyte!*

The Nyasaland plant is the type of this species; the plentiful material varies from scabrid to softly hairy. The Angola fragment is imperfect, and appears the same so far as it goes. The lower anther-cell is definitely tailed, but in one example only obscurely so.

13. ***J. læta***, *S. Moore in Journ. Bot.* 1880, 311. Perennial, 3 ft. high, hairy. Leaves up to 5 by $1\frac{3}{4}$ in., elliptic-lanceolate, acute at either end; petiole $\frac{1}{2}$ in. long. Spikes forming a terminal panicle, $1\frac{3}{4}$ by $\frac{3}{4}$ in., or a compound panicle 3 by 2 in., continuous, rather lax; bract $\frac{1}{3}$ - $\frac{1}{2}$ in. long, lanceolate from an elliptic base, minutely hairy; bracteoles $\frac{1}{4}$ in. long, similar to the bracts. Sepals 5, $\frac{1}{3}$ in. long, linear or oblong-linear; two anticus rather broader; posticous hardly smaller than the two adjacent, but sometimes wanting (fide *S. Moore*). Corolla $\frac{3}{4}$ in. long, violet. One anther-cell below the other, tailed; pollen ellipsoid, with 2 stopples and single rows of tubercles. Pistil glabrous, except a few minute hairs near the style-base. Fruit unknown.—*J. malangana*, *Lindau in Engl. Jahrb.* xx. 71, and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5081! 5108! Malange, *Buchner*, 118!

14. ***J. simplicispica***, *C. B. Clarke*. Stem 12-18 in. long, weak, hairy. Leaves 1-2 in. long, elliptic or oblong, obtuse at either end, hairy beneath, finally nearly glabrous. Petiole 0- $\frac{1}{8}$ in. long. Spike $1\frac{1}{4}$ by $\frac{3}{4}$ -1 in., rather dense; bracts each containing one flower (true bracts) $\frac{2}{3}$ in. long, tip broad-elliptic, lanceolate; bracteoles 2, $\frac{1}{2}$ in. long, linear. Sepals 5, $\frac{1}{3}$ - $\frac{1}{2}$ in. long, linear; posticous one distinctly shorter. Corolla $\frac{1}{2}$ - $\frac{2}{3}$ in. long. Filaments glabrous; upper anther-cell shortly

tailed, lower with long tail, clavate, shortly 2-lobed at the tip; pollen ellipsoid, longitudinally 3-banded without tubercles. Ovary shaggy.

East Tropical Africa. Without locality, *Scott-Elliot!*

Capsule not seen. This may be a *Monechma*, near *M. depauperatum*.

15. **J. fittonioides**, *S. Moore in Journ. Bot.* 1878, 134. Nearly stemless. Leaves 5 by 4 in., round ellipsoid, white-blotched, glabrous, minutely pubescent on the nerves beneath, base cordate; petiole $\frac{1}{2}$ –2 in. long. Peduncle axillary 2–4 $\frac{1}{2}$ in. long. Spike up to 2 by $\frac{3}{4}$ in., interrupted; floral leaves $\frac{1}{4}$ in. long, ovate, with 1–4 flowers (a condensed cyme); bract to flower $\frac{1}{5}$ in. long, linear-oblong. Sepals 5, $\frac{1}{8}$ in. long, linear, pubescent. Corolla scarcely $\frac{1}{3}$ in. long. Filaments glabrous; one anther-cell much lower than the other, tailed; pollen ellipsoid, with 3 stopples, the longitudinal ribs obscure, not reaching the pole. Ovary minutely hairy; style-base thinly hairy. Capsule $\frac{2}{3}$ – $\frac{3}{4}$ in. long, glabrous or nearly so, 4-seeded; stalk $\frac{1}{4}$ – $\frac{1}{3}$ in. long, solid, rather slender; seeds rough; placentæ not rising elastically.—*Nicoteba fittonioides*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 329, and in Engl. Pfl. Ost-Afr. C. 370.

Nile Land. British East Africa: Nyika country near Mombasa, *Wakefield!*

This is placed in *Betonica* by S. Moore, and in *Nicoteba* by Lindau. The pollen is right for *Nicoteba*, but the "bracts" described by S. Moore are not homologous with the bracts of *J. Betonica*.

16. **J. mossambicensis**, *Lindau in Engl. Pfl. Ost-Afr. C.* 373. Annual, 1 $\frac{1}{2}$ ft. high, pubescent. Leaves $\frac{3}{4}$ by $\frac{1}{4}$ in., ovate, obtuse. Flowers 3–1, clustered in the axils of each floral leaf; floral leaves in spikes terminal and on very short axillary branches; proper floral leaves round, $\frac{1}{4}$ in. in diam., imbricated, interspersed with oblong leaves $\frac{1}{2}$ – $\frac{3}{4}$ in. long; calyx $\frac{1}{10}$ in. long. Corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long. One anther-cell below the other strongly tailed. Ovary 4-ovulate (*Lindau*).—*Adhatoda mossambicensis*, Klotzsch in Peters, Reise Mossamb. 217

Mozamb. Dist. Portuguese East Africa: Mozambique Isle, *Peters!* in Berlin Herbarium.

The example is young, and nearly all the spikes have been damaged by some insect. The very small flowers point to sect. *Harnieria*, which the round bracts do not suit.

17. **J. baravensis**, *C. B. Clarke*. Branches 2 ft. long, crooked, divided, nearly glabrous, with many cystoliths. Leaves $\frac{1}{2}$ by $\frac{1}{3}$ in., ovate, minutely scabrous, hairy, finally glabrate; petiole 0– $\frac{1}{12}$ in. long. Spikes terminal up to 2 by $\frac{1}{2}$ in., more or less interrupted at the base; pubescent, with many gland-tipped hairs; middle floral leaves (even in fruit) loosely imbricate, $\frac{1}{4}$ by $\frac{1}{10}$ in., narrow-elliptic, obtuse, with 3–1 flowers; bracteoles 2, $\frac{1}{5}$ in. long, linear-obovate. Sepals 5, linear, $\frac{1}{6}$ in. long, hairy. Corolla (from fragments) $\frac{1}{3}$ in. long. Capsule $\frac{1}{8}$ in. long, sessile, 2-seeded, ellipsoid, with many deflexed hairs. Seeds compressed, black, ammonite-marked—i.e. resembling those of *J. flava*, but smaller.

Nile Land. South Somaliland: Barava, *Hildebrandt*, 1809!

No specimen at Kew.

18. **J. flava**, Vahl, *Symb.* ii. 15, not of Kurz. Herb, 2–4 ft. high, hairy. Leaves up to $3\frac{1}{4}$ by $1\frac{1}{4}$ in. (usually smaller), ovate-lanceolate, hairy on both surfaces, shortly decurrent on the petiole; petiole $0-\frac{2}{3}$ in. long. Spikes terminal, 4–8 by $\frac{3}{4}$ in., continuous, or interrupted at the base, lower whorls sometimes distant and passing into axillary clusters; floral leaves $\frac{1}{3}-\frac{1}{2}$ in. long, broad-lanceolate to linear-oblong, obtuse, containing 3–1 flowers, green, hairy; flower-bract nearly similar but smaller. Sepals 5, $\frac{1}{10}-\frac{1}{8}$ in. long, with long white hairs and also with very short moniliform hairs. Filaments glabrous; one anther-cell below the other, tailed; pollen ellipsoid with two stopples and a row of tubercles on each side of the stopple upon the longitudinal band. Ovary nearly glabrous except at the top; style hairy below, branches 2, very short, oblong, subequal. Capsule $\frac{1}{3}$ by $\frac{1}{8}$ in., 4-seeded, shortly and densely retrorse-hairy; stalk $\frac{1}{10}-\frac{1}{8}$ in. long, nearly as thick as the capsule; seeds globose, moderately compressed, yellow-brown, finally nearly black, marked by corrugations perpendicular to the margin (as in many Ammonites).—*J. plicata*, Vahl, Enum. i. 156; Schumach. & Thonn. Beskr. Guin. Pl. 11; T. Anders. in Journ. Linn. Soc. vii. 39; Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 345; S. Moore in Journ. Bot. 1880, 310; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349. *J. fasciata*, Drège, Zwei Pfl. Docum. 160, 195; T. Anders. in Journ. Linn. Soc. vii. 39; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373. *J. major*, T. Anders. in Journ. Linn. Soc. vii. 39; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373; and in Ann. Istit. Bot. Roma, vi. (1896) 83. *J. minor*, T. Anders. in Journ. Linn. Soc. vii. 39; Engl. Hochgebirgsfl. Trop. Afr. 392; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349; Rendle in Journ. Bot. 1896, 411. *J. palustris*, Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 345; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373 (including var. *dispersa*, Lindau in Engl. Jahrb. xx. 72), not of T. Anders. *J. suaveolens*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349. *J. fallax*, Lindau in Engl. Jahrb. xx. 74, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349. *J. fruticulosa*, Lindau in Engl. Jahrb. xx. 75, and partly in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349. *Dianthera americana*, α and β Forsk. Descr. Ægypt.-Arab. 9. *D. flava*, Vahl, *Symb.* i. 5. *Tyloglossa major* and *T. minor*, Hochst. in Flora, 1843, 73. *Adhatoda flava*, Nees in DC. Prod. xi. 401. *A. plicata*, Nees in DC. Prod. xi. 401; Benth. in Hook. Niger Fl. 484. *A. suaveolens*, Nees in DC. Prod. xi. 401. *A. major*, Nees in DC. Prod. xi. 397; A. Rich. Tent. Fl. Abyss. ii. 156. *A. minor*, Nees in DC. Prod. xi. 400; A. Rich. Tent. Fl. Abyss. ii. 156; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 103, 242; Zarb, Catal. Spéc. Bot. Pfund, 32. *A. fasciata*, Nees in DC. Prod. xi. 402.

Upper Guinea. Gold Coast: Cape Coast Castle, Vogel! Togoland, Büttner, 218! 258! 286! 289! 397! 648! Kling, 188! 190! Baumann, 393! Lagos, Millen, 32! 37! Rowland! Niger Territory: by the River Quorra (Niger), Vogel, 167! Lower Niger; Onitsa, Barter, 619! 1779!

Nile Land. Nubia: Hor Tamanib near Suakin, Lord! Erkowit Mountain

near Suakin, *Schweinfurth*, 256! Eritrea: Aidereso, 4000 ft., *Schweinfurth & Riva*, 1445! Ginda, 3000 ft., *Schweinfurth & Riva*, 2128! Keren, *Steudner*, 1526! Habab, 6000 ft., *Hildebrandt*, 681! Abyssinia: Gondar, *Boehm*, 53! mountains near Gageros, 3500–6000 ft., *Schimper*, 172! 2296! Modat, *Schimper*, 1043! Tacazze River, 4000 ft., *Schimper*, 1251! and without precise locality, *Schimper*, 31! 429! 685! 1224! Somaliland: on the coast at Barava, *Kirk*! Galle Borani, *Riva*, 240! Daa River, *Riva*, 1192! Adda Galla, *James & Thrupp*! Darrar and Smith River, *Donaldson Smith*! and without precise locality, *Miss Edith Cole*! British East Africa: east side of Lake Albert Edward, *Scott-Elliot*, 8085! Uganda, *Stuhlmann*, 1367! Bukoba, *Stuhlmann*, 4005! Kavirondo; Samia, *Scott-Elliot*, 7082! Maungu Mountain, 2000 ft., *Johnston*! Taita; Ndara Mountain, 2000–3000 ft., *Hildebrandt*, 2451! *Gregory*! Ukamba, *Hildebrandt*, 2714! 2717! *Gregory*! Sabaki River, *Gregory*! Duruma, *Hildebrandt*, 2334! Mombasa, *Kirk*! *Hildebrandt*, 1940! *Scott-Elliot*, 6120! 6125! Nyika country near Mombasa, *Wakefield*!

Lower Guinea. Angola: Loanda, *Welwitsch*, 5135! Pungo Andongo, *Welwitsch*, 5074! 5097! Golungo Alto, 1000–2500 ft., *Welwitsch*, 5183! Huilla, *Welwitsch*, 5035! 5036! *Antunes*, 142! Ambriz, *Monteiro*! Malange, *Buchner*, 46!

Mozamb. Dist. German East Africa: Kilimanjaro, *Volkens*, 513! 440! *Meyer*, 61! 346! *New*! *Johnston*, 59! Usambara; Tanga, *Volkens*, 171! Rahe, *Volkens*, 2207! Mascheua, *Holst*, 8732! 8867! East Africa, *Fischer*, 87! Portuguese East Africa: Mozambique, *Prelado*, 23! British Central Africa: Nyasaland, Masuka Plateau, 6500–7000, *Whyte*!

The colour of the corolla is known to be yellow in *J. plicata* (the Upper Guinea plant), in the more ovate-leaved Angola plant, in the Abyssinia (Eritrea) plant, and in the Mozambique examples (including the Natal *J. fasciata*). The colour of the corolla is not known to me in *J. major* and *J. minor* (Abyssinia); but the type examples appear to me identical with the *J. flava* from Arabia and Eritrea (*Schweinfurth*). Species have been founded on the degree of denseness of the inflorescence, and the distance ($\frac{1}{2}$ –2 in.) by which the lowest whorl of 6 (or fewer) flowers stands apart from the next upper whorl. S. Moore says that “in this species there is considerable diversity in the size and number of seeds on the same specimen”; and Lindau refers *J. major* to sect. *Monechma*, *J. plicata* to sect. *Rostellaria*. I remark on these views that *J. major* and *J. plicata* look to me identical, and that the seeds are most uniform in all the examples cited here. The most striking aberrations from the typical *J. flava* among the material above brought together are:

(1) *Hildebrandt*, 1940, from Mombasa (and several similar examples from the same neighbourhood), published by Lindau as *J. palustris*, var. *dispersa*: this has ovate leaves, 1 by $\frac{2}{3}$ in. The indumentum of the calyx is that of *J. flava* (not of *J. palustris*).

(2) *Welwitsch*, 5035, 5097, from Angola (and other examples from the same locality), published by S. Moore as *J. plicata*, var.; this has ovate leaves, but is rather larger than *Hildebrandt*, 1940.

(3) *Rowland's* Lagos plant, which has floral leaves up to $\frac{3}{4}$ in. long, spikes dense (in one case going off into a close compound panicle).

(4) *Schweinfurth*, 256, from Mount Erkowit, near Suakin, a small plant with small leaves, and the spike much interrupted below (with, in fact, axillary clusters of flowers). This may be a separable species; but the fruit and seeds, the flower and calyx-indumentum, are as in *J. flava*.

19. ***J. palustris***, *T. Anders. in Journ. Linn. Soc.* vii. 38. Leaves up to $6\frac{1}{2}$ by $1\frac{1}{2}$ in., oblong, tapering at either end; petiole very short. Sepals hispid, without minute moniliform hairs; otherwise as *J. flava*.—Zarb, *Catal. Spéc. Bot. Pfund*, 32; Lindau in *Engl. & Prantl, Pflanzenfam.* iv.

3 B. 279, fig. 108, E, and in Ann. Istit. Bot. Roma, vi. (1896) 82. *Tyloglossa palustris* and *T. acuminata*, Hochst. in Flora, 1843, 72, 73. *Adhatoda palustris*, Nees in DC. Prod. xi. 402; A. Rich. Tent. Fl. Abyss. ii. 157; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 103. *A. acuminata*, Nees in DC. Prod. xi. 400; A. Rich. Tent. Fl. Abyss. ii. 156. *Gendarussa palustris*, Hochst. in Flora, 1843, 72.

Nile Land. Kordofan, *Kotschy*, 61! 80! Gallabat, *Schweinfurth*, 74! Abyssinia: near Gafta, *Schimper*, 1211! near Goelleb, *Schimper*, 139! 2156! Somaliland, *Keller*, 194! 195! 180!

This species is here separated from *J. flava* solely by the indumentum of the calyx. Several examples determined by Oliver and Lindau as *J. palustris* have been cited accordingly under *J. flava*. The Somali example called *J. palustris* by Lindau (*Riva*, 1156) has not been seen; *Keller*, 194, is smaller and greyer than *J. palustris*, and is named *J. suaveolens* by Lindau.

20. **J. kirkiana**, *T. Anders. in Journ. Linn. Soc.* vii. 39. Leaves $1\frac{3}{4}$ by $\frac{1}{2}$ in., lanceolate, or (in one example) $4\frac{1}{2}$ by $\frac{1}{3}$ in., linear, otherwise as *J. flava*.—Lindau in Engl. Pfl. Ost-Afr. C. 373. *J. fasciata*, Lindau in Engl. Pfl. Ost-Afr. C. 373.

Mozamb. Dist. German East Africa: Usambara; Duga, *Holst*, 3216! Portuguese East Africa: Lower Zambesi; Lupata, *Kirk*! Shiramba, *Kirk*! and Tete Hill, *Kirk*! Lake Nyasa, *Simons*!

The example of *Holst*, marked by Lindau *J. fasciata*, Nees (i.e. for me *J. flava*), matches very well one of the type examples of *J. kirkiana*. That is to say, the present species might be an extreme form of *J. flava*, but the flowers appear, when dried, white with purple marks, and were noted by *Holst* as "white purple-stained."

21. **J. nyassana**, *Lindau in Engl. Jahrb.* xx. 66. Floral leaves lanceolate or linear-lanceolate, very acute; bracts and bracteoles with linear yellow-hairy tips. Corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Capsule $\frac{1}{4}$ – $\frac{1}{3}$ in. long, otherwise as *J. flava*.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373.

Mozamb. Dist. German East Africa: Usaramo, *Stuhlmann*, 6875! Ukami; Mrogoro, *Stuhlmann*, 8220! Usambara, *Holst*, 485! British East Africa: Nyasaland; Kondowe to Karonga, 2000–6000 ft., *Whyte*! Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte*! Mount Chiradzulu, 4000 ft., *Whyte*! and without precise locality, *Whyte*, 40! *Buchanan*, 290!

Capsule 4-seeded, but Lindau puts the species in sect. *Monechma*. Lindau also says the spikes are subcapitate, the corolla glabrous; he described from poor material. The corolla is perhaps purple.

22. **J. linearispica**, *C. B. Clarke*. Root woody; branches 6–10 in. long, minutely pubescent. Leaves 1 by $\frac{1}{4}$ in., oblong, subobtuse at either end, sessile, when mature glabrous. Spike 4 by $\frac{1}{4}$ in., much interrupted at the base; floral leaves scarcely $\frac{1}{4}$ in. long, lanceolate, 2–1-flowered—i.e. containing usually one corolla and an empty bract to upper flower. Sepals 4, $\frac{1}{6}$ in. long, linear-lanceolate, hairy and with stalked glands, the 5th posticous much smaller. Corolla $\frac{1}{3}$ in. long. One anther-cell below the other, tailed; pollen with 2 stopples banded, tubercles minute. Ovary shaggy, style glabrous. Capsules $\frac{1}{3}$ by scarcely $\frac{1}{12}$ in., linear, hairy.

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Mozamb. Dist. British East Africa: Stevenson Road, between Lake Nyasa and Lake Tanganyika, *Scott-Elliott*, 8267!

This species is manifestly close to *J. stachytarphetoides*; the inflorescence and flowers are very similar though smaller; the leaves are diverse.

23. **J. longecalcarata**, *Lindau in Engl. Jahrb.* xx. 73. Innovations dense with yellow strigose hairs. Leaves 3 by $\frac{3}{4}$ in., glabrate except for obscure hairs on the midrib beneath; petiole $\frac{1}{4}$ in. long. Spikes $\frac{1}{2}$ – $\frac{3}{4}$ in. long, hairy; bracts and bracteoles linear-oblong, obtuse. Calyx, corolla, stamens, and pistil nearly as of *J. flava*. Capsule $\frac{1}{2}$ in. long, 4-seeded, glabrous.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349, and in *Engl. Pfl. Ost-Afr.* C. 373.

Nile Land. British East Africa: Ukamba, *Hildebrandt*, 2721! South of Lake Baringo at Nyemps, *Gregory*!

Mozamb. Dist. German East Africa: Kilimanjaro; *Volkens*, 1764! 2184! and on the plain between Upper Pangani River and Himo River, south-east of Kilimanjaro, 2200–2600 ft., *Volkens*, 563!

In *Volkens*, 2184, the entire spikes are hardly $\frac{2}{3}$ in. long; the fine examples of *Gregory* have inflorescences up to 9 in. long; the lowest whorl of flowers $2\frac{1}{2}$ in. distant.

24. **J. tanaensis**, *C. B. Clarke*. Branches 2 ft. long, glabrate, full of cystoliths; innovations with strigose hairs. Leaves $3\frac{1}{2}$ by $1\frac{1}{4}$ in., narrowed at both ends, nearly glabrate, full of cystoliths; petiole $\frac{1}{2}$ –1 in. long; upper leaves smaller, passing gradually into floral leaves, $1\frac{1}{2}$ by $\frac{1}{4}$ in. Spikes terminal, interrupted, nearly glabrous; flowers 3–1 in each floral leaf-axil. Sepals 5, $\frac{1}{4}$ in. long and upwards, linear-oblong, white-margined, slightly scabrous. Corolla $\frac{1}{2}$ in. long or rather more, bluish (*Thomas*), hairy without. One anther-cell below the other, long-tailed. Capsule $\frac{1}{2}$ in. long, rather stout, 4-seeded, glabrous.

Nile Land. British East Africa: Tana River, *Thomas*, 38!

The smooth capsule brings this next *J. longecalcarata*. The long-petioled green leaves do not match.

25. **J. aridicola**, *Rendle in Journ. Bot.* 1896, 410. Woody; branches grey-tomentose. Leaves $\frac{2}{3}$ by $\frac{1}{4}$ – $\frac{1}{2}$ in., elliptic to round, grey-tomentose or finally nearly glabrate; petiole 0– $\frac{1}{8}$ in. long. Spike $2\frac{1}{2}$ by $\frac{1}{2}$ in., with 6 whorls, lower approximate, topmost hardly confluent; floral leaves $\frac{1}{4}$ – $\frac{1}{3}$ in. long, linear, somewhat obovate, with 3–1 flowers. Sepals 5, $\frac{1}{4}$ in. long, linear, subequal, pubescent. Corolla $\frac{1}{2}$ – $\frac{2}{3}$ in. long. One anther-cell below the other, long-tailed; pollen ellipsoid, with 2 bands and stopples, a row of tubercles on either side of the stopple. Style with very few scattered hairs. Capsule $\frac{1}{3}$ in. long, 4-seeded, glabrous; stalk $\frac{1}{10}$ in. long, solid; placentæ not rising elastically; seeds tubercled, much as in *J. flava*.

Nile Land. Somaliland: Adda Galla, *James & Thrupp*! Hammar, *Miss Edith Cole*! Darar, *Donaldson Smith*!

26. **J. stachytarphetoides**, *C. B. Clarke*. Hairy, 3-8 ft. high. Leaves $4\frac{1}{2}$ by 2 in., broad-elliptic, acuminate at either end; petiole $\frac{1}{2}$ -1 in. long. Spikes 8-13 by $\frac{1}{2}$ in.; lowest whorls 1 in. apart, upper confluent, 3-1-flowered; outermost bract (floral leaf) $\frac{1}{4}$ in. long, elliptic, acute; bract and bracteoles (or sterile bracts?) $\frac{1}{5}$ in. long, lanceolate, hairy. Sepals 5, $\frac{1}{5}$ in. long, subequal, linear. Corolla $\frac{1}{2}$ in. long. One anther-cell lower than the other, oblique, long-tailed; pollen ellipsoid, with 2 longitudinal bands, large stopples, no tubercles. Young pistil glabrous.—*Duvernoia stachytarphetoides*, Lindau in Engl. Pfl. Ost-Afr. C. 372, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 339.

Mozamb. Dist. German East Africa: Umba River Valley, *Smith!* Usaramo, *Stuhlmann*, 8121! Portuguese East Africa: Beira, *Schlechter!* Lower Zambesi; Shupanga, *Kirk!* *Scott!*

The capsule has not been seen, and possibly may be densely minutely hairy, though the young pistil is glabrous under the microscope. It is difficult to form genera that are "natural" in the Order *Acanthaceæ*, but it is surely too unnatural to place this species under *Duvernoia*. Lindau appears to have done this on one character only—viz., that the lines of tubercles often seen on the smooth bands of the pollen in *Justicia* are here not actual tubercles, but obscurely indicated by markings (as is the case in some species placed by Lindau in *Justicia*).

27. **J. togoensis**, *Lindau in Engl. Jahrb.* xx. 72. Small herb. Leaves $1\frac{1}{3}$ by $\frac{3}{4}$ in., elliptic, hairy, subsessile. Inflorescence terminal, $\frac{1}{2}$ in. long, dense; bracts $\frac{3}{5}$ by $\frac{1}{2}$ in., very hispid; bracteoles $\frac{3}{5}$ in. long, linear. Sepals $\frac{2}{5}$ in. long, linear-oblong, white-edged, hispid. Corolla $\frac{2}{3}$ in. long. Lower anther-cell tailed.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349.

Upper Guinea. Togoland, *Büttner*, 222!

The example is young, the spike not grown out; the affinity is perhaps with *J. flava*, as Lindau suggests.

28. **J. ulugurica**, *Lindau in Engl. Jahrb.* xxii. 126. Branches woody. Leaves 1 by $\frac{1}{2}$ in., ovate, acute, glabrous. Spikes terminal, loose, short; bracts $\frac{1}{4}$ in. long, lanceolate; bracteoles minute. Sepals $\frac{2}{5}$ in. long, subulate, glandular, hairy. Corolla green or light violet; tube $\frac{2}{3}$ in. long and more; limb $\frac{1}{4}$ in. long. Lower anther-cell tailed. Fruit wanting.

Mozamb. Dist. German East Africa: Ukami; Uluguru, *Stuhlmann*, 8866!

29. **J. diffusa**, *Willd. Sp. Pl.* i. 87. Stems 8-24 in. long, weak, hairy. Leaves $1\frac{1}{2}$ by $\frac{1}{2}$ - $\frac{3}{4}$ in., elliptic or ovate, narrowed at either end, sparsely hairy; petiole 0 - $\frac{1}{5}$ in. long. Spikes 1 - $1\frac{1}{2}$ by $\frac{1}{4}$ - $\frac{1}{3}$ in., sparsely hairy; bracts $\frac{1}{5}$ in. long, narrow-lanceolate, green with scarious margins; bracteoles similar to the bracts but smaller. Sepals 4, $\frac{1}{6}$ in. long, narrow-lanceolate. Corolla $\frac{1}{4}$ in. long, purple or rose. Filaments glabrous; one anther-cell below the other, tailed; pollen ellipsoid, with 2 longitudinal bands, not tubercled. Ovary nearly glabrous; style thinly hairy, branches 2, subequal, minute. Capsule $\frac{1}{5}$ in. long,

4-seeded, minutely hairy (at least on the top and sutures); seeds with simple tubercles all over.—T. Anders. in Journ. Linn. Soc. ix. 512; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 538. *J. procumbens*, Linn. Fl. Zeyl. 7, at least in part; T. Anders. in Journ. Linn. Soc. vii. 40; Engl. Hochgebirgsfl. Trop. Afr. 393. *J. simplex*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349. *Rostellularia diffusa*, Nees in Wall. Pl. As. Rar. iii. 100, and in DC. Prod. xi. 371. *R. abyssinica*, Nees in DC. Prod. xi. 372; A. Rich. Tent. Fl. Abyss. ii. 153. *Barleria pumila*, Hochst. ex Nees in DC. Prod. xi. 372.

Nile Land. Abyssinia: Tigre; lower part of Mount Sholoda, *Schimper*, 21! on mountains near Axum, *Schimper*, 1524! and without precise locality, *Schimper*, 639! *Quartin-Dillon & Petit*, 285!

All this African material is alike, but in matching it against the numerous subspecies of *J. procumbens* found in India, different views have been taken, some uniting it with *J. simplex*, D. Don.

30. ***J. insularis***, *T. Anders. in Journ. Linn. Soc. vii. 40.* Herbaceous; branches 3 ft. long, straggling, angular, more or less hispid; lower nodes distant, often flower-bearing. Leaves up to $3\frac{1}{2}$ by $\frac{3}{4}$ –1 in., narrowed at either end, slightly hairy on both surfaces or glabrate; petiole $\frac{1}{4}$ –1 in. long. Flowers 3–1 in each axil, sessile; floral leaves $\frac{1}{4}$ – $\frac{1}{3}$ in. long, round or obovate, some narrower often added. Sepals 5, subequal, $\frac{1}{8}$ – $\frac{1}{6}$ in. long, broad-lanceolate or subovate, scarcely acute, sparsely hispid. Corolla exceeding $\frac{1}{2}$ in. in length, purple; tube very little dilated at the top; anticous lobe much longer than the posticous 2-fid lobe. Filaments glabrous; one anther-cell below the other, tailed; pollen ellipsoid, with 2 stopples, longitudinally banded, with several rows of tubercles on the band. Ovary glabrous; style base hairy. Capsule exceeding $\frac{1}{3}$ in. long, glabrous, 4-seeded, with a short thick solid stalk; seeds reticulate rugose.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373, partly. *J. rostellarioides*, Lindau in Engl. Jahrb. xx. 69, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349. *J. karschiana*, Büttner in Verhandl. Bot. Ver. Brandenb. xxxii. 1890, 40. *Adhatoda diffusa*, Benth. in Hook. Niger Fl. 483.

Upper Guinea. Sierra Leone, *Afzelius!* Lagos, *Rowland!* Yoruba, *Millson*, 40! Togoland, *Kling*, 187! *Büttner*, 110! 187! 228! Cameroons: Rio del Rey, *Johnston!* *Staudt*, 83! 469! Yaunde, *Zenker*, 564! 612! *Zenker & Staudt*, 343! Batanga, *Bates*, 41! Fernando Po, *Vogel!* *Mann*, 168!

Lower Guinea. Gaboon: Munda; Sibange Farm, *Soyaux*, 296! *Büttner*, 463! Angola: San Salvador, *Büttner*, 457!

Soyaux, 296, is identical with *Vogel's* Fernando Po plant. *Vogel's* specimen at Kew is noted on the herbarium sheet "dimorphic fruit," which is very likely to be the case; but I can find no dimorphic fruit on any of the West African species of this group. It is possible that the herbarium note was grounded on *J. Lindau*, which is extremely like *J. insularis*, but has linear very acute sepals.

31. ***J. calcarata***, *Hochst. in Flora*, 1843, 73, *in obs.* Rootstock woody, oblique. Branches 2 ft. long, weak, with soft spreading hairs in places. Leaves up to 3 by 1 in., tapering at either end, with scattered

hairs on both surfaces or glabrous except the midrib beneath; petiole $0\frac{1}{3}$ in. long. Flowers 3-1 in each axil, sessile, floral leaves $\frac{1}{4}$ - $\frac{1}{3}$ in. long, ovate or elliptic, some narrower oblong often added. Sepals 5, subequal, $\frac{1}{8}$ - $\frac{1}{4}$ in. long, broadly lanceolate or linear-obovate, scarcely acute, glabrous or very minutely hispid. Corolla exceeding $\frac{1}{2}$ in. in length, purple; tube very little dilated at the top; anticous lobe distinctly longer than the posticus 2-fid lobe. Filaments glabrous; one anther-cell below the other, tailed; pollen ellipsoid, with 2 stopples, longitudinally banded, with several rows of tubercles on the band. Ovary glabrous; style-base hairy. Capsule $\frac{1}{3}$ in. long, glabrous, 4-seeded, with a short thick solid stalk; seeds reticulate rugose.—*J. neglecta*, T. Anders. in Journ. Linn. Soc. vii. 40 (Abyssinian plant only); Zarb, Cat. Spéc. Bot. Pfund. 32; Engl. Hochgebirgsfl. Trop. Afr. 393 (Abyssinian plant only). *J. Rostellaria*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373, in small part, and in Ann. Istit. Bot. Roma vi., 1896, 82. *Tyloglossa Schimperii*, Hochst. in Flora, 1843, 73. *Adhatoda Rostellaria*, Nees in DC. Prod. xi. 397; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 103, 242; Zarb, Cat. Spéc. Bot. Pfund, 32. *Rostellaria Schimperii*, Hochst. in Flora, 1843, 73 in obs.

Nile Land. Kordofan, *Pfund*, 39! 432! Eritrea: Marakhat Valley, Saganeiti, 7000 ft., *Schweinfurth & Riva*, 1708! Gallabat, *Schweinfurth*, 75! 76! Abyssinia: near Adowa, *Schimper*, 106! 1101! *Steudner*, 1522! *Quartin-Dillon & Petit*, 294! and without precise locality, *Schimper*, 964! *Plowden*! British East Africa: Bongo; Gurfala, *Schweinfurth*, 2241!

This species should perhaps be united with *J. insularis*, from which it hardly differs except by its green (not dark) colour. T. Anderson united it with *J. Galeopsis*, which has a different calyx. The sheet in Kew Herbarium, with Hochstetter's printed ticket, "*Tyloglossa rostrata*, Schimper, 1657 and 1659," is marked *Adhatoda Rostellaria*, β *humilis*, Nees, and contains *Justicia calcarata* and *Asystasia Schimperii*, mixed. As to the specific name to be selected, *J. calcarata*, Hochst., represents the plant here described, while *J. neglecta*, T. Anders. (still more *J. Rostellaria*, Lindau) represents an agglomeration of plants here separated.

32. **J. Galeopsis**, T. Anders. MS. Petioles shorter than in *J. insularis*, the leaves being mostly oblong, subsessile. Sepals $\frac{1}{4}$ in. long and upwards, linear, very subulate upwards; otherwise as *J. insularis*.—*J. neglecta*, T. Anders. in Journ. Linn. Soc. vii. 40, partly. *Adhatoda Kotschyi*, Benth. in Hook. Niger Fl. 483.

Upper Guinea. Upper Senegal, *Lécard*, 145! Gambia, *Skues*! Sierra Leone: Sugarloaf Mountain, *Scott-Elliott*, 3974! Regent, *Scott-Elliott*, 4149! and without precise locality, *Afzelius*! *Forster*! *Don*! *Winwood Reade*! Dahomey, *Burton*! Lagos: Abbeokuta, *Irving*, 65! on the road to Akokulu, *Millen*, 61! and without precise locality, *Rowland*! *Millen*, 169! Niger Territory: Nupe, *Barter*, 1038! Cameroons, 700 ft., *Passarge*, 19A! 21A! 27A! 38A! 71A!

Nile Land. Jur, *Schweinfurth*, 1744!

This species differs from *J. insularis*, T. Anders., in the long subulate tips to the sepals. *Millen*, 169, has very thick stems, $\frac{1}{5}$ in. in diam., and glabrous succulent leaves, and may be specifically separable. *Millen*, 61, excellently dried, has full purple-red flowers, while there is on it the collection note of Millen (doubtless correct), "yellow."

33. **J. Lazarus**, *S. Moore in Journ. Bot.* 1880, 313. Sparingly pubescent or glabrate. Leaves 1–2 in. long, ovate or elliptic, upper often narrower, oblong; petiole $0\text{--}\frac{1}{6}$ in. long. Sepals $\frac{1}{8}$ in. long, linear-subulate, pubescent. Corolla $\frac{1}{3}$ in. long, or less, otherwise resembling *J. Galeopsis*.—*J. insularis*, *S. Moore in Journ. Bot.* 1880, 341; Lindau in *Engl. Pfl. Ost-Afr. C.* 373. *J. thomeensis*, Lindau in *Engl. Jahrb.* xxii. 126; and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349.

Lower Guinea. Angola: Golungo Alto, 1000–2400 ft., *Welwitsch*, 5117! 5143! 5211! Pungo Andongo, *Welwitsch*, 5093! Huilla, *Welwitsch*, 5051! 5058! *Antunes*! Islands of St. Thomas, *De Louza*!

This is very like *J. Melampyrum*, *S. Moore*, but has the capsule glabrous.

34. **J. leikipiensis**, *S. Moore in Journ. Bot.* 1894, 137. Stems angular, glabrous or patently hispid. Lower leaves 2 by $\frac{1}{2}$ in., lanceolate or ovate-lanceolate, upper linear $1\frac{1}{2}$ by $\frac{1}{8}\text{--}\frac{1}{6}$ in., subsessile. Sepals $\frac{1}{4}\text{--}\frac{1}{3}$ in. long, linear-subulate, minutely pubescent. Corolla $\frac{3}{4}\text{--}1$ in. long; tube narrow, only slightly funnel-shaped upwards; otherwise as *J. Galeopsis*.—Lindau in *Engl. Pfl. Ost-Afr. C.* 373. *J. neglecta*, Oliv. in *Trans. Linn. Soc.* xxix. 129. *Justicia*, sp. n. 6, T. Thoms. in *Speke, Nile Append.* 643.

Nile Land. Eritrea; Habab, *Schweinfurth*, 459! Abyssinia: Sokota, *Rohlf* & *Stecker*! Aman Eske, 7000 ft., *Schimper*, 418! British East Africa: Unyoro, *Speke & Grant*! Uganda, *Wilson*, 91! Lykipia, *Gregory*!

35. **J. dyschoristeoides**, *C. B. Clarke*. Stems trailing, with many erect branches. Leaves $\frac{3}{4}$ by $\frac{1}{2}$ in., obtuse, very glabrous. Sepals $\frac{1}{6}$ in. long, lanceolate, scarious, thinly hispid, minutely red-dotted. Corolla $\frac{1}{3}$ in. long. Capsule slightly exceeding $\frac{1}{4}$ in. in length, glabrous; otherwise as *J. calcarata*.—*Justicia*, sp. aff. *J. neglectæ*, Oliv. in *Trans. Linn. Soc.* ser. 2, Bot. ii. 345.

Mozamb. Dist. German East Africa: Kilimanjaro, 4000–6500 ft., *Johnston*.

This plant bears a remarkable general likeness to *Dyschoriste radicans*; the habit, stems, leaves, inflorescence, general size of flowers and erect fruits, might deceive any collector in the field.

36. **J. pinguior**, *C. B. Clarke*. Stout, hairy. Leaves $2\frac{1}{2}$ by 1 in., ovate, hairy on both surfaces; petioles less than $\frac{1}{8}$ in. long. Flowers 3–1, sometimes more, in dense axillary clusters; floral leaves $\frac{1}{3}\text{--}\frac{2}{3}$ in. long, ovate; proper flower-bracts 0 or minute. Sepals $\frac{1}{3}\text{--}\frac{1}{2}$ in. long, linear, hispid. Corolla $\frac{1}{2}\text{--}\frac{2}{3}$ in. long, purple, broad. One anther-cell wholly below the other, tailed; pollen long-ellipsoid, with 2 stopples and several rows of tubercles on each side of them. Ovary glabrous; style-base hispid; disc unusually large, cup-shaped. Capsule $\frac{1}{2}$ in. long, glabrous; stalk very short; seeds 4-tubercled.

Nile Land. British East Africa: Lykipia, 6000–8000 ft., *Thomson*! Ruwenzori; Toru Dist., Kivata, 8300 ft., *Scott-Elliot*, 7656!

This species differs much from all the preceding, and should perhaps be removed to another part of the genus.

37. **J. sexangularis**, Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 349. Stems 20 in., branched, 6-angular, scabrid-hairy. Leaves up to 2 by $\frac{1}{3}$ in., oblong, subobtuse, minutely and sparsely scabrid, hairy, subsessile. Flowers 3-1 in an axil (no terminal spike); floral leaves oblong. Sepals $\frac{1}{4}$ in. long, linear, subobtuse, microscopically scabrid-hairy. Corolla $\frac{1}{3}$ in. long, purple. Capsule $\frac{1}{3}$ - $\frac{1}{8}$ in. long, narrow-ellipsoid, slightly hairy near the top; stalk very short; seeds 4, densely tubercled.—*J. palustris*, T. Anders. in Journ. Linn. Soc. vii. 38, partly. *Tyloglossa Kotschyi*, Hochst. in Flora, 1843, 74. *Adhatoda Kotschyi*, Nees in DC. Prod. xi. 397 (excluding var. β). *Rostellaria sexangularis*, Hochst. in Flora, 1843, 74.

Nile Land. Kordofan: Melbes, *Kotschy*, 293!

Nees (in DC. Prod. xi. 397) joined this plant with a Senegambian plant, probably *J. Galeopsis*, T. Anders., with which this species might be united. I have not found the scrap of D. Don's collecting which Bentham (in Hook. Niger Fl. 483) thinks may have been *Adhatoda Kotschyi*, Nees. It was by some slip that T. Anders. reduced this species to *J. palustris*, T. Anders., which has (as T. Anderson says) "flowers in terminal spikes."

38. **J. filifolia**, Lindau in Engl. Jahrb. xx. 70. Straggling, sparingly hairy; branches elongate with long internodes. Leaves 3 in. long, lanceolate and ovate-lanceolate, nearly glabrous; petioles up to $1\frac{1}{2}$ in. long; upper leaves (sometimes nearly all the leaves) narrow, linear-oblong or oblong, $\frac{1}{6}$ - $\frac{1}{2}$ in. broad. Flowers 1-3 together in the distant axils, often surrounded by several shortened floral leaves $\frac{1}{4}$ - $\frac{1}{3}$ in. long, elliptic or orbicular. Sepals $\frac{1}{8}$ in. long, narrow-lanceolate, acute, hispid. Corolla $\frac{1}{3}$ - $\frac{1}{2}$ in. long, white with purple marks. Ovary hairy. Capsule $\frac{1}{4}$ in. long, hairy all over.—Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373.

Mozamb. Dist. German East Africa: Ukami; Mrogoro, *Stuhlmann*, 8233! Portuguese East Africa: Lower Zambesi; Shupanga, *Kirk*! British East Africa: Nyasaland: near Blantyre, *Last*! *Buchanan*, 51! Mandala, *Scott*! Zomba, 5000-6000 ft., *Whyte*! Kondowe to Karonga, 2000-6000 ft., *Whyte*! and by the River Shire, *Kirk*!

Last's specimen, from which Lindau described, has lost all the lower leaves, the upper are very narrow, as usual in this species.

39. **J. Whytei**, S. Moore in Trans. Linn. Soc. ser. 2, Bot. iv. 32. Rootstock stout, woody; branches 1-2 ft. long, hairy. Leaves lanceolate, lower often ovate, hairy; petiole 0- $\frac{1}{4}$ in. long, mostly very short. Flowers axillary, 1-3 together. Sepals $\frac{1}{5}$ in. long, linear, acute, hairy. Corolla $\frac{1}{2}$ in. long, purple. Pollen of *Justicia* with 3 stopples (*Lindau*) or with 2 (in example supplied by Lindau). Capsule exceeding $\frac{1}{4}$ in. long, hairy.—Lindau in Engl. Pfl. Ost-Afr. C. 373. *J. Rostellaria*, Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373, in great part. *J. fruticulosa*, Lindau in Engl. & Prantl, *Pflanzenfam.* iv. 3 B. 349, partly.

Upper Guinea. Cameroons: 4000 ft., *Passarge*, 129!

Nile Land. Eritrea: Erkowit Mountain, *Schweinfurth*, 256! British East

Africa: Lykipia, Thomson! near Lake Naivasha, 6000 ft., Scott-Elliott, 7038! Ukamba, Scott-Elliott, 6306 partly! 6489!

Mozamb. Dist. German East Africa: Karagwe; Bukoba, Stuhlmann, 4124 Kilimanjaro: Lake Chala, Volkens, 319! and Marangu, 5000 ft., Volkens, 711! Usambara, Holst, 8914! 8935 partly! British Central Africa: Nyasaland; Shire Highlands, on Mount Ndirandi, Scott-Elliott, 8467! Mount Mlanje, Whyte! 136! Masuka Plateau, 6500-7000 ft., Whyte! and without precise locality, Buchanan, 304! 641! 711!

In the examples called *J. Rostellaria* by Lindau, the leaves are more ovate than in the type *J. Whytei* (with lanceolate leaves); but the acute linear sepals and hairy capsule do not bring it near *J. calcarata*. The other part of Scott-Elliott, 6306, is *Disperma kilimandscharicum*.

40. **J. Melampyrum**, S. Moore in Trans. Linn. Soc. ser. 2, Bot. iv. 32. Sparingly minutely hairy; branches weak, 1-2 ft. long. Leaves mostly elliptic-oblong, short-petioled, $1\frac{1}{2}$ -2 in. long; but on some specimens are leaves (from the lower half of the branch) broadly ovate with longer petioles. Flowers axillary, about 3 in each axil; floral leaves often round or ovate, $\frac{1}{4}$ - $\frac{1}{3}$ in. in diam., but longer oblong floral leaves occur. Sepals $\frac{1}{6}$ - $\frac{1}{5}$ in. long, lanceolate, acute, hispid. Corolla $\frac{1}{3}$ - $\frac{1}{2}$ in. long. Normal capsule $\frac{1}{3}$ in. long, thinly hairy all over with 4-tubercled seeds; abnormal capsules $\frac{1}{8}$ in. long, nearly glabrate.—Lindau in Engl. Pfl. Ost-Afr. C. 373. *J. insularis* (an var. ?), Oliv. in Trans. Linn. Soc. xxix. 129. *Justicia*, sp. n. 7, T. Thoms. in Speke, Nile Append. 643. *Adhatoda striata*, Klotzsch in Peters, Reise Mossamb. 216.

Nile Land. British East Africa: Ruwenzori, Scott-Elliott, 7764!

Lower Guinea. Angola; Malange, Buchner, 121!

Mozamb. Dist. German East Africa: Dar-es-Salaam, Stuhlmann, 7557! Muansa, Stuhlmann, 4161! and without precise locality, Speke & Grant! Portuguese East Africa: Rios de Sena, Peters, 8! Mossambique, Prelado, 12! mountains east of Lake Nyasa, Johnson! British Central Africa: Kondowe to Karonga, 2000-6000 ft., Whyte! Masuka Plateau, 6500-7000 ft., Whyte! Nyasaland; Fort Johnston, Scott-Elliott, 8411! Blantyre, Buchanan, 126! Whyte! Mount Zomba, 4000-6000 ft., Whyte! Mount Mlanje, Whyte, and without precise locality, Buchanan, 535! 980!

41. **J. Lindau**, C. B. Clarke. Branches patently hispid. Leaves (even the uppermost) ovate-lanceolate, hairy. Floral leaves obovate, round. Corolla $\frac{1}{2}$ in. long and upwards. Normal capsules exceeding $\frac{1}{4}$ in. in length; abnormal 1-seeded capsules fully $\frac{1}{8}$ in. long, with strongly tubercled wings.—*J. heterocarpa*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, fig. 139, K-O, and in Engl. Pfl. Ost-Afr. C. 373, partly.

Nile Land. British East Africa: Tana River, Thomas, 59!

Mozamb. Dist. German East Africa: Usambara, Kwa Mshuza, Holst, 4324!

Lindau, in calling this *J. heterocarpa*, supposes that the large flowers produce the normal capsules, while the abnormal capsules arise from very small (or cleistogamous) flowers similar to those seen on *J. heterocarpa*. This is very probably so. But the *J. heterocarpa*, T. Anders., appears to me to differ by its dense clusters and long-tipped white-hairy sepals; moreover, though the examples of *J. heterocarpa*, T. Anders., show abundant normal capsules, they do not show a single corolla approaching in size that of Holst, 4324.

42. **J. shebelensis**, *Rendle in Journ. Bot.* 1896, 409. Very woody, much-branched undershrub; branchlets hairy or glabrate. Leaves $\frac{1}{2}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., obovate, rounded, hairy; petiole scarcely $\frac{1}{12}$ in. long. Flowers 4–1, subsessile in remote leaf-axils. Sepals 5, $\frac{1}{5}$ in. long, subulate, hairy. Corolla $\frac{1}{3}$ in. long, yellow. Lower anther-cell tailed. Capsule unknown.

Nile Land. Somaliland: River Shebele, *Donaldson Smith!*

43. **J. heterocarpa**, *T. Anders. in Journ. Linn. Soc.* vii. 41. Annual, 8–20 in. high; pubescent. Leaves $1\frac{1}{2}$ by $\frac{1}{2}$ – $\frac{3}{4}$ in.; ovate or ovate-lanceolate, minutely pubescent or glabrate; petiole up to $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Axillary clusters dense, of 2–4 or more flowers. Sepals $\frac{1}{8}$ in. long, linear, tips acute white-hairy. Corolla $\frac{1}{5}$ – $\frac{1}{4}$ in. long. Capsule $\frac{1}{8}$ – $\frac{1}{6}$ in. long; seeds 4, tubercled; abnormal 1-seeded capsules seen in all the examples cited.—C. B. Clarke in *Hook. f. Fl. Brit. Ind.* iv. 531; *Engl. Hochgebirgsfl. Trop. Afr.* 393; Lindau in *Engl. Pfl. Ost-Afr. C.* 373, partly. *Harnieria dimorphocarpa*, Solms-Laub. in *Schweinf. Beitr. Fl. Aethiop.* 110, 243.

Nile Land. Nubia: coast up to 4000 ft., *Bent! Schweinfurth*, 83! 347! Eritrea: Mount Ghedem, near Massowa, *Schweinfurth & Riva*, 120! Keren, *Steudner*, 1505! Bogos, *Hildebrandt!* Abyssinia: Togodele, *Ehrenberg!* Gageros, 4000 ft., *Schimper*, 162! 2300! and without precise locality, *Schimper*, 1296A! Somaliland: Hahi, *James & Thrupp!* Warandab, *Keller*, 214! British East Africa: on rocks above Lake Elmeteita, *Scott-Elliott*, 6630!

Mozamb. Dist. German East Africa: Kilimanjaro; Marangu, 4800 ft., *Volkens*, 900! British Central Africa: Kamboli, *Nutt!*

44. **J. leptocarpa**, *Lindau in Engl. Jahrb.* xx. 70. Closely resembles *J. heterocarpa*, but is rather larger in all its parts. Clusters dense, of many flowers. Sepals $\frac{1}{5}$ in. long, linear-lanceolate to linear, acute, green with white margins, white-hairy. Capsule $\frac{1}{5}$ in. long, sparsely hairy; abnormal capsules rarely found.—Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349, and in *Engl. Pfl. Ost-Afr. C.* 373.

Nile Land. Eritrea: Keren, *Steudner*, 1505! near Saati, *Schweinfurth & Riva*, 500!

Mozamb. Dist. German East Africa: Kilimanjaro; Marangu, 2700 ft., *Volkens*, 2167! Usambara; Kwa Mshuza, *Holst*, 8903! Plains near Pangani, *Volkens*, 454! Masheua, *Holst*, 8799! British Central Africa: Ngamiland; Kwebe, *Lugard*, 129!

Volkens, 454, appears identical with *Steudner*, 1505, which Solms-Laubach marked *J. heterocarpa*, possibly correctly. But I cannot find an abnormal capsule on these examples.

45. **J. Mollugo**, *C. B. Clarke*. Scabrous hispid. Leaves numerous, up to $\frac{3}{4}$ by $\frac{1}{6}$ – $\frac{1}{5}$ in., oblong. Axillary clusters subcymosely developed; flowers pedicellate. Corolla scarcely $\frac{1}{5}$ in. long. Capsules $\frac{1}{8}$ – $\frac{1}{6}$ long, with many-celled hairs on the upper part; none abnormal.—*J. leptocarpa*, Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349, partly.

Mozamb. Dist. British Central Africa: Nyasaland; Karonga, 2000–6000 ft., *Whyte!* and without precise locality, *Buchanan!*

46. **J. Lortææ**, *Rendle in Journ. Bot.* 1897, 379. Branches 8–16 in. long, slender, woody, round, glabrous, with long internodes. Leaves 1 by $\frac{1}{10}$ in., linear, glabrous. Flowers 2 (or oftener 1) sessile in remote axils; bract and bracteoles less than $\frac{1}{8}$ in. long. Sepals 5, nearly $\frac{1}{4}$ in. long, subequal, linear, minutely pubescent. Corolla $\frac{1}{2}$ – $\frac{2}{3}$ in. long; anticus lip longer than the posticus. One anther-cell much below the other, strongly tailed. Capsule $\frac{2}{3}$ in. long, 4-seeded, glabrous; stalk $\frac{1}{8}$ – $\frac{1}{6}$ in. long, solid, thick; placentæ not rising elastically; seeds tubercular-scabrous.

Nile Land. Somaliland; Upper Sheikh, and Waggar Mountains, *Mrs. Lort-Phillips!*

47. **J. Phillipseæ**, *Rendle in Journ. Bot.* 1897, 378. Root stout. Branches scarcely 6 in. long, slender, divaricate, glabrous; internodes long. Leaves up to $\frac{1}{2}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., ovate, scarcely acute, glabrous; petiole up to $\frac{1}{8}$ in. long. Flowers solitary, rarely 2 together, axillary, sessile; bract 0. Sepals 5, equal, $\frac{1}{5}$ in. long, linear, with few hairs, very few gland-tipped. Corolla $\frac{1}{2}$ in. long, purple, glabrous without, very sparingly hairy within. One anther-cell below the other, tailed. Capsule $\frac{2}{3}$ in. long, 4-seeded, smooth; stalk short, solid, thick.

Nile Land. Somaliland: Golis Range, *Mrs. Lort-Phillips!* Waggar Mountains, *Mrs. Lort-Phillips!* Upper Sheikh, *Mrs. Lort-Phillips!* and between Dobar and Hammer, *Mrs. Lort-Phillips!* *Donaldson Smith*, 337!

48. **J. odora**, *Vahl, Enum.* i. 164. Undershrub, 1–2 ft. high, glabrous (except the calyx and corolla); twigs woody, glaucous. Leaves 1 by $\frac{1}{4}$ – $\frac{1}{3}$ in. (in *Thomas*, 81, up to 3 by $1\frac{3}{4}$ in.), obtuse, base narrowed; petiole 0– $\frac{1}{8}$ in. long. Flowers axillary, solitary or more rarely 2–3 together, the cyme being then developed with obovate floral leaves $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Sepals 5, $\frac{1}{6}$ in. long, linear, microscopically pubescent. Corolla $\frac{1}{2}$ in. long, yellow (*Thomas*). One anther-cell below the other, tailed; pollen of *Justicia*, stopples 2. Capsules $\frac{1}{2}$ in. long, rather stout, 4-seeded, glabrous; stalk nearly $\frac{1}{6}$ in. long, thick, solid; seeds tubercular-scabrous.—*T. Anders.* in *Journ. Linn. Soc.* vii. 42; *Lindau* in *Ann. Istit. Bot. Roma*, vi. 1896, 82; *Rendle* in *Journ. Bot.* 1896, 398. *J. polymorpha*, *Schinz* in *Verhandl. Bot. Ver. Brandenb.* xxxi. (1889) 203; *Lindau* in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349. *J. leucodermis*, *Schinz* in *Verhandl. Bot. Ver. Brandenb.* xxxi. (1889) 202. ? *Dianthera odora*, *Forsk. Fl. Ægypt.-Arab.* 8. *Adhatoda odora*, *Nees* in *DC. Prod.* xi. 399. *A. Hypericum*, *Solms-Laub.* in *Schweinf. Beitr.* Fl. Æthiop. 102.

Nile Land. Nubia: Suakim, *Schweinfurth*, 642! Abyssinia: Mawerr, 3000 ft., *Schimper*, 136! Tacazze River, 3000–4000 ft., *Schimper*, 2135! and without precise locality, *Schimper*, 1447! Somaliland: Widaba, *Miss Edith Cole!* Tola (Tula?) River, *Kirk!* Habr Aual, *Robecchi*, 262! *Donaldson Smith!* Tana River, *Thomas*, 81! Habab, 3000 ft., *Hildebrandt*, 454!

Lower Guinea. Amboland: Oshando, *Schinz*, 32!

Mozamb. Dist. Ngamiland: near Kwebe, *Lugard*, 72!

“When dried smells as *Anthoxanthum*,” *Nees*.

49. **J. sansibarensis**, *Lindau in Engl. Jahrb.* xx. 71. Stout shrub; branches pubescent. Leaves up to $2\frac{1}{4}$ by 1 in., ovate, obtuse, when mature glabrous; petiole $\frac{1}{2}$ in. long; upper leaves scarcely 1 in. long, subsessile, round elliptic, passing into small round floral leaves. Flowers 3-1 in each axil; bracts and bracteoles minute or 0. Calyx $\frac{1}{3}$ in. long. Corolla $\frac{2}{3}$ in. long. One anther-cell lower than the other, spurred. Capsule $\frac{1}{2}$ in. long, 4-seeded, glabrous; stalk short; seeds tubercular-scabrous.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349, and in *Engl. Pfl. Ost-Afr.* C. 373.

Mozamb. Dist. Zanzibar, *Hildebrandt*, 983! German East Africa, *Hannington*!

50. **J. Fischeri**, *Lindau in Engl. Jahrb.* xx. 65. Glabrous; branches woody. Leaves $\frac{3}{4}$ -2 in. long, ovate; base rounded; tip triangular-apiculate; primary nerves prominent beneath; margins white, thickened and often hispid-ciliate; petiole hardly any. Flowers 3-1 in the axils of distant leaf-pairs; bracts $\frac{1}{3}$ by $\frac{1}{6}$ in., elliptic. Sepals 5, equal, $\frac{1}{6}$ in. long, glabrous, lanceolate with linear tip. Corolla $\frac{1}{2}$ - $\frac{2}{3}$ in. long, yellow. One anther-cell below the other, tailed; pollen ellipsoid, banded, with 2 stopples; tubercles obsolete. Ovary glabrous; style-base hairy. Capsule $\frac{1}{2}$ in. long, glabrous, stalked, 4-seeded.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349, and in *Engl. Pfl. Ost-Afr.* C. 373.

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, *Holst*, 8897! and without precise locality, *Fischer*, 89! 490!

Var. ? *latevirens*, C. B. Clarke. Leaves $\frac{2}{3}$ by $\frac{1}{5}$ in., oblong or narrow elliptic, narrowed at base, green when dried, primary nerves obscure beneath, margin not thickened but hispid-ciliate; petiole $\frac{1}{20}$ - $\frac{1}{12}$ in. long, distinct; otherwise as *J. Fischeri*.—*J. latevirens*, *Rendle in Journ. Bot.* 1896, 409.

Nile Land. Somaliland: between Lake Stephanie and Lake Rudolph, *Donaldson Smith*!

This looks distinct from Fischer's plant; but in *Holst*, 8897, there are on one branch leaves varying from narrow cuneate-oblong apiculate to ovate obtuse.

51. **J. brevicaulis**, *S. Moore in Journ. Bot.* 1880, 341. Rhizome thick. Branches 2-3 in. long, hairy. Leaves $\frac{3}{4}$ by $\frac{1}{4}$ in., obovate-oblong, subobtuse, hairy, finally more or less glabrate, subsessile. Peduncles up to $\frac{3}{4}$ in. long, axillary, 1-flowered, hairy; bracteoles 2 a little below the flower, $\frac{1}{10}$ in. long, linear, hairy. Sepals $\frac{1}{5}$ in. long, linear-oblong, hairy. Corolla $\frac{1}{2}$ in. long or rather more, violet (*S. Moore*). Lower anther-cell shortly tailed; pollen ellipsoid with 2 stopples and bands, no tubercles.—*Engl. Hochgebirgsfl. Trop. Afr.* 393.

Lower Guinea. Angola: Huilla, *Welwitsch*, 5774!

52. **J. microphylla**, *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349. Procumbent, woody, $1\frac{1}{2}$ ft. long. Leaves up to $\frac{1}{2}$ by $\frac{1}{4}$ in., ovate-oblong, pubescent. Flowers axillary, solitary; bracts $\frac{1}{3}$ in. long, obovate. Sepals $\frac{1}{8}$ in. long. Corolla $\frac{1}{3}$ in. long. Anther-cells obliquely opposite. Capsule rather more than $\frac{1}{4}$ in. long, 4-seeded,

glabrous.—Lindau in Engl. Pfl. Ost-Afr. C. 373. *Adhatoda microphylla*, Klotzsch in Peters, Reise Mossamb. 217.

Mozamb. Dist. Portuguese East Africa: Mozambique Isle, *Peters!*

The material for this species is in such a state that I can add little to Lindau's account. But there are ripe capsules and the species is certainly a *Justicia*.

53. **J. gesnerifolia**, *Rendle in Journ. Bot.* 1896, 398 (*gesneriflora*, *Rendle, l.c.* 414). A woody, small, much branched, pubescent shrub; branches 6 in. long, angular. Leaves 1 by $\frac{1}{2}$ in., spatulate-obovoid, green, minutely pubescent on both faces, subsessile. Flowers axillary, solitary, $\frac{3}{4}$ in. long, corolla-tube much inflated. Lower anther-cell tailed; pollen ellipsoid with 2 longitudinal bands. Capsule $\frac{2}{5}$ in. long, 4-seeded, glabrous.

Nile Land. Somaliland: Shebele River, *Donaldson Smith!*

The name intended by Rendle was *gesneriflora*.

54. **J. diclipteroides**, *Lindau in Engl. Jahrb.* xx. 65. Herbaceous; branches numerous, 8 in. long, pubescent upwards. Leaves up to 1 by $\frac{2}{5}$ in., ovate or narrow elliptic, acuminate or obtuse, pubescent; petiole $0-\frac{1}{5}$ in. long. Flowers axillary, solitary or 2 together; bracts very small. Sepals $\frac{1}{5}$ in. long, subulate, hairy. Corolla less than $\frac{1}{2}$ in. long, purple-red. Capsule $\frac{1}{4}$ in. long, stalked, 4-seeded, sparsely hairy.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373.

Nile Land. British East Africa: Ukamba, *Hildebrandt*, 2726! Duruma, *Hildebrandt*, 2331! Taita Mountains, *Gregory!* and Leikipia, Nyuri River, *Gregory!*

55. **J. urbaniana**, *Lindau in Engl. Jahrb.* xx. 64. Small, slender, very rigid shrub; branches hispid or strigose. Leaves $\frac{1}{5}-\frac{1}{3}$ in. long, elliptic or oblong, sparsely hairy; petiole $0-\frac{1}{12}$ in. long. Flowers 1-2 in the leaf-axils; bracts $\frac{1}{12}-\frac{1}{6}$ in. long, obovate or roundish. Sepals $\frac{1}{8}-\frac{1}{5}$ in. long, linear, minutely hairy. Corolla $\frac{1}{4}-\frac{1}{3}$ in. long. One anther-cell below the other, tailed; pollen ellipsoid, banded, with 2 stopples and rows of tubercles. Capsule $\frac{1}{3}$ in. long, 4-seeded, pubescent.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349.

Nile Land. Somaliland: Ahl Mountains, *Hildebrandt*, 860B! Maid, *Hildebrandt*, 1402! Darror, *James & Thrupp!*

56. **J. Gendarussa**, *Linn. f. Suppl.* 85. Shrubby, 2-4 ft. high. Leaves 4 by $\frac{3}{4}$ in., glabrous; petiole $\frac{1}{6}$ in. long. Spikes terminal, 4 by $\frac{3}{4}$ in., almost continuous, lax, often running into a panicle by the development of the cymes in the lower axils; bracts linear, scarcely $\frac{1}{6}$ in. long. Sepals $\frac{1}{6}$ in. long, nearly glabrous. Corolla $\frac{1}{2}$ in. long, or rather more, nearly glabrous, white or rose with purple spots; tube very little widened upwards. One anther-cell lower than the other, tailed; pollen with 2 stopples, banded, without tubercles (or with

tubercles according to Lindau in Engl. Jahrb. xviii. 64, t. 2, fig. 95). Capsule $\frac{1}{2}$ in. long, clavate, glabrous; seeds unknown.—Jacq. Eclog. Pl. t. 11; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 532; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 347, fig. 139, D, and in Engl. Pfl. Ost-Afr. C. 373. *Gendarussa vulgaris*, Nees in Wall. Pl. As. Rar. iii. 104, and in DC. Prod. xi. 410; Wight, Ic. t. 468.

Mozamb. Dist. Zanzibar, *Stuhlmann*, 698! 1058! German East Africa: Usambara; Tanga, *Volkens*, 146! Portuguese East Africa: Gorongosa, *Carvalho*!

The Zanzibar examples of this common South-Asian plant (now widely spread in warm countries) were probably introduced into Africa; it may be otherwise with the Tanga example.

57. **J. Rendlei**, *C. B. Clarke*. Branch $3\frac{1}{2}$ ft. long, stout, nearly glabrous. Leaves 3 by $1\frac{1}{2}$ in., narrowed at both ends, nearly glabrous; petiole $\frac{3}{4}$ – $1\frac{1}{2}$ in. long. Cymes axillary, short, 3–8-flowered, arranged in terminal panicles; floral leaves $\frac{1}{3}$ –1 in. long, resembling the lower leaves but smaller. Sepals 5, $\frac{1}{4}$ in. long, linear-lanceolate, pubescent. Corolla $1\frac{1}{4}$ in. long; tube $\frac{1}{2}$ in. long, rather thick; lips broad, curved. One anther-cell transverse, the other below it, with a fine longish tail, or several short fine tails or nearly tailless; pollen globose with 3 stopples, longitudinal smooth depressions very narrow and not reaching the poles, without rows of tubercles. Pistil glabrous.—*Duvernoia speciosa*, Rendle in Journ. Bot. 1896, 129, 411.

Nile Land. Somaliland: Sheikh Husein, *Donaldson Smith*!

58. **J. Preussii**, *C. B. Clarke*. Stem 6–9 ft. high, with deflexed hairs. Leaves $5\frac{1}{2}$ by 2 in., elliptic, acute at either end, when young hairy, when mature hairy on the nerves of both surfaces; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. long. Inflorescence terminal, 6 by 1 in., a constricted linear panicle, grey-hairy; branches very short 1–4-flowered cymes, with a floral leaf at the base of each branch, $\frac{1}{4}$ to $\frac{3}{4}$ in. long, elliptic, acute; flower-bract scarcely $\frac{1}{3}$ in. long, linear. Sepals $\frac{1}{5}$ in. long, equal, linear-lanceolate, grey hairy. Corolla $1\frac{1}{2}$ in. long, clear blue, hairy without; tube $\frac{1}{3}$ in. long; anticous lip $\frac{3}{4}$ –1 in. broad, with 3 short ovate lobes; posticous lip $\frac{1}{3}$ in. broad, oblong, nearly entire. Stamens 2; filaments glabrous; anther-cells 2, one completely below the other, elliptic; upper oblique transverse, hairy, with a minute basal spur or muticous; lower distinctly spurred; pollen ellipsoid, longitudinally banded, with one row of depressed tubercles on either side of each of the 3 stopples. Style-base hairy, tip very shortly and equally 2-fid. Capsule $\frac{3}{4}$ by $\frac{1}{5}$ in., thickly hairy, 4-seeded; stalk $\frac{1}{5}$ in. long; seeds rugose.—*J. spectabilis*, T. Anders. MS. *Salviacanthus Preussii*, Lindau in Engl. Jahrb. xx. 75, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 351, fig. 107, G, fig. 141, A.

Upper Guinea. Cameroons: Buea, 3000 ft., *Preuss*, 675! Cameroon Mountain, 2000 ft., *Mann*, 1298!

This is separated generically from *Justicia* by Lindau on the ground that the upper anther-cell is sometimes shortly tailed, as is the case in several other species of *Justicia* (as in *J. simplicispica*).

59. **J. salviiflora**, *C. B. Clarke*. Young branches and inflorescence densely covered with brown gland-tipped hairs. Leaves $1\frac{1}{3}$ by $\frac{2}{3}$ in., ovate, narrowed at either end, hairy; petiole $\frac{1}{4}$ in. long. Inflorescence terminal, leafless, loosely and irregularly paniced; bracts hardly $\frac{1}{8}$ in. long, linear. Calyx $\frac{1}{5}$ in. long, divided nearly to the base into 5 equal linear-lanceolate segments. Corolla-tube $\frac{1}{3}$ in. long; lips $\frac{3}{4}$ in. long, gaping, upper strongly curved. Filaments glabrous; one anther-cell entirely below the other, strongly tailed; pollen ellipsoid, with 3 stopples; longitudinal bands without tubercles. Ovary densely glandular hairy; style hairy at the base only, branches 2, subequal, minute.—*Duvernoia salviiflora*, Lindau in Engl. Jahrb. xx. 42, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 339, and in Engl. Pfl. Ost-Afr. C. 372.

Mozamb. Dist. German East Africa: Massaini, *Fischer*, 506! Usagara, *Stuhlmann*, 207.

60. **J. grisea**, *C. B. Clarke*. Shrub, densely minutely grey pubescent. Leaves $\frac{2}{3}$ by $\frac{1}{3}$ in., ovate, very pubescent, finally glabrate. Spikes terminal and axillary, short, few-flowered; bracts $\frac{1}{4}$ by $\frac{1}{12}$ in., glandular hairy. Sepals $\frac{1}{4}$ in. long, pubescent. Corolla $1\frac{1}{8}$ in. long; lips $\frac{2}{3}$ in. long, broad, curved. One anther-cell lower than the other, long-spurred; pollen ellipsoid, banded, without tubercles. Ovary hairy.—*Duvernoia somalensis*, Lindau in Ann. Istit. Bot. Roma, vi. [1896] 81.

Nile Land. Somaliland: Daua River, *Riva*, 427!

61. **J. beloperonoides**, *Lindau in Engl. Jahrb.* xxii. 127. Branches 2 ft. long, woody. Leaves 1 by $\frac{1}{2}$ in., ovate, hairy, soon glabrate; base obtuse, sometimes subcordate; petiole $0-\frac{1}{10}$ in. long. Cymes 2-1-flowered, in the penultimate axils; bracts linear, small. Sepals $\frac{1}{3}$ in. long, linear, hairy and with a few stalked glands. Corolla carmine-red; tube $\frac{2}{3}-\frac{3}{4}$ in. long, cylindric, much curved, narrowly funnel-shaped upwards; lips $\frac{1}{3}-\frac{1}{2}$ in. long. One anther-cell below the other, distinctly tailed; pollen ellipsoid, banded, with 2 longitudinal rows of tubercles on either side of each of the two pores.

Mozamb. Dist. German East Africa: Uluguru near Lukwangulu, 8000 ft., *Stuhlmann*, 9141!

62. **J. laxa**, *T. Anders. in Journ. Linn. Soc.* vii. 43. Shrubby, 4-5 ft. high; young parts densely minutely grey tomentose, becoming nearly glabrous. Leaves 9 by $4\frac{1}{4}$ in., narrowed at either end; petiole 1-2 in. long. Panicle terminal, 10 by 6 in., open; branches distant, rectangular, spreading, subdeflexed, often again divided, with an ovate floral leaf 1- $1\frac{1}{2}$ in. long at the base of most of the branches; pedicels $\frac{1}{8}-\frac{1}{4}$ in. long; bracts $\frac{1}{8}$ in. long, linear, often several indicating a condensed cyme with only one flower developed. Sepals 5, subequal, $\frac{1}{4}-\frac{1}{3}$ in. long, narrow-oblong, acute, nearly glabrous. Corolla $\frac{1}{2}-\frac{2}{3}$ in. long, greenish-white (*G. Mann*). One anther-cell below the other, distinctly tailed; pollen ellipsoid, with 3 stopples; beside each stopple

a single longitudinal row of round spots, not tubercles. Capsule 1 in. long, 4-seeded, pubescent; stalk $\frac{1}{3}$ in. long, solid; seeds tubercular-scabrous.—*Adhatoda paniculata*, Benth. in Hook. Niger Fl. 482. *Duvernoia paniculata*, Lindau in Engl. Jahrb. xx. 43, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 339.

Upper Guinea. Cameroons, *Preuss*, 1350! Fernando Po, *Vogel*, 144! *Mann*, 63!

Var. *contracta*, C. B. Clarke. Panicle branches shortened, hardly exceeding 1 in. in length: floral leaves (all but the lowest) reduced, $\frac{1}{3}$ in. long, linear. Capsule 1 in. long, 4-seeded; stalk exceeding $\frac{1}{2}$ in. in length, narrow, solid; seeds tubercular.

Upper Guinea. Cameroons: Efulen, *Bates*, 367! Jensoki, *Buchholz*! Lolodorf, *Staudt*, 418!

Lower Guinea. Gaboon: Munda; Sibange Farm, *Soyaux*, 399!

63. **J. pyramidata**, C. B. Clarke. Upper part of the stem viscous rusty with many-celled hairs. Leaves broadly ovate or obovate, rusty hairy on the midrib beneath. Panicles 8 by $\frac{1}{4}$ in.; floral leaves $\frac{1}{3}$ in. long, linear. Corolla light-red (*G. Mann*); otherwise as *J. laxa*.—*Duvernoia pyramidata*, Lindau in Engl. Jahrb. xxii. 124.

Upper Guinea. Cameroons: Yaunde, *Zenker & Staudt*, 460! Bipinde, *Zenker*, 1047!

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1671!

These examples match one another closely, and appear distinct enough from typical *J. laxa*, but *J. laxa*, var. *contracta*, is about half way between.

64. **J. extensa**, T. Anders. in Journ. Linn. Soc. vii. 44. Panicle 6-10 in. long, oblong or ovate. Calyx hairy. Filaments minutely hairy; pollen ellipsoid, banded, with 2 stopples, and one row of depressed tubercles on each side of each stopple. Ovary shaggy. Capsule rather shorter than that of *J. laxa*, shortly hairy all over.—S. Moore in Journ. Bot. 1880, 341. *Duvernoia extensa*, Lindau in Engl. Pfl. Ost-Afr. C. 372. *D. Stuhlmanni*, Lindau in Engl. Jahrb. xx. 43, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 339.

Upper Guinea. Sierra Leone: near Kambia, *Scott-Elliott*, 4210! Ashanti, *Cummins*, 6! Lagos: Eppah, *Barter*, 3301! Musin Road, *Millen*, 21 of 1892 collection! near Lagos, *Rowland*, 12! 34! Cross River, *Johnston*!

Lower Guinea. Angola, *Welwitsch*, 1248!

Mozamb. Dist. Between Tanganyika and Victoria Nyanza, 3000 ft., *Stuhlmann*, 2953!

The breadth and degree of compounding of the panicle varies considerably. The panicle is more hairy than that of *J. laxa*, but the mature leaves are often shining glabrous.

65. **J. cordata**, T. Anders. in Journ. Linn. Soc. vii. 44. Shrub, nearly glabrous except the flowers; branches woody. Leaves 1 by $\frac{1}{2}$ in., ovate, subsessile; base truncate or cordate. Peduncles $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long, rigid, angular, obliquely erect, from the lower and upper axils; flowers 1-3, clustered in a congested cyme at the apex of a peduncle, bracts smaller than the sepals. Sepals 5, equal, $\frac{1}{8}$ in. long, lanceolate; minutely and sparsely pubescent. Corolla-tube scarcely $\frac{1}{4}$ in. long;

lobes $\frac{1}{2}$ in. long, anticous 3-lobed, posticous erect, curved, subentire, hooded. Anther-cells separated by a broad connective, oblique, one slightly lower and with a short distinct tail; pollen small, oblong-ellipsoid, banded longitudinally, with 2 large stopples, no tubercles. Ovary glabrous; style-base very sparsely hairy. Capsule $\frac{3}{4}$ in. long, glabrous; stalk $\frac{1}{3}$ in. long, very thick, solid.—Engl. Hochgebirgssl. Trop. Afr. 393. *J. cynanchifolia*, R. Br. in Salt, Abyss. Append. 62. *Leptostachya cordata*, Nees in DC. Prod. xi. 378. *Rhaphidospora cordata*, Nees in DC. Prod. xi. 499; A. Rich. Tent. Fl. Abyss. ii. 161; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 113, 244; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 329, fig. 110, N a (not b), and in Engl. Pfl. Ost-Afr. C. 370. *Gendarussa cordata*, Hochst. ex Nees in DC. Prod. xi. 379, and 499.

Nile Land. Eritrea: Bellaka, 5000–6000 ft., *Hildebrandt*, 461! Habab, *Hildebrandt*, 632! Barasio Valley, 5000 ft., *Schweinfurth & Riva*, 699! near Acrur, 6200 ft., *Schweinfurth & Riva*, 759! 1231! and Keren, *Steudner*, 1518! Abyssinia: mountain sides along the river Tacazze, *Schimper*, 1250! and without precise locality, *Schimper*, 242! 1384! *Salt*!

Mozamb. Dist. German East Africa! Kilimanjaro, 3500 ft., *Volkens*, 1735!

66. **J. piloso-cordata**, *C. B. Clarke*. Branches 3 ft. long, softly hairy. Leaves $2\frac{1}{4}$ by 1 in., subobtuse at either end, hairy, very hairy on the nerves; petiole scarcely $\frac{1}{10}$ in. long. Peduncles 1 in. long, axillary, solitary, hairy, 1-flowered; bract $\frac{1}{8}$ in. long, linear-lanceolate, Sepals 5, $\frac{1}{6}$ – $\frac{1}{5}$ in. long, linear-lanceolate, minutely hispid. Corolla $\frac{3}{4}$ in. long; stamens and ovary as of *J. cordata*.

Lower Guinea. Angola: Malange, *Mechow*, 453!

This plant greatly resembles *J. cordata*, except in its hairiness. The 1-flowered peduncles do not make much difference, for the arrangement of the bracts shows that the flower (in *J. piloso-cordata*) represents a reduced congested cyme.

67. **J. masaiensis**, *C. B. Clarke*. Shrub; branchlets woody, quadrangular, hairy; internodes $\frac{1}{4}$ – $\frac{1}{2}$ in. long. Leaves up to $\frac{3}{4}$ by $\frac{1}{2}$ in., sessile, round-elliptic, glabrate, reticulated beneath, tip obtuse, apiculate. Spikes 0–1 in. long, lateral 3–1-flowered; bracts smaller than the calyx; flowers solitary. Calyx $\frac{1}{8}$ in. long; lobes 5, somewhat united at the base, linear, triangular, sub-3-nerved, minutely scabrous. Corolla $\frac{2}{3}$ in. long, very hairy without; tube $\frac{1}{4}$ in. long, lips broad. One anther-cell below the other, rather strongly tailed; pollen ellipsoid, stopples 2; a row of spots on each side of each stopple.

Nile Land. British East Africa: *Scott-Elliot*, 6634!

68. **J. interrupta**, *C. B. Clarke*. Shrub. Leaves up to 7 by 3 in., ovate, acute at either end, glabrous; petiole up to 1 in. long. Panicle 8 in. in diam., open, nearly leafless; flowers in sessile distant clusters on the branches; bracts $\frac{1}{8}$ in. long, linear. Sepals $\frac{1}{8}$ in. long, lanceolate, minutely hairy. Corolla $\frac{2}{3}$ in. long; tube $\frac{1}{4}$ in. long. Lower anther-

cell with a distinct small spur, sometimes altogether mucous; pollen ellipsoid, banded; stopples 2, without rows of tubercles.—*Duvernoia interrupta*, Lindau in Engl. Jahrb. xxii. 123.

Mozamb. Dist. German East Africa: Ukami; Uluguru, *Stuhlmann*, 8967!

69. **J. glabra**, *Roxb. Hort. Beng.* 4. Pubescent or nearly glabrous except the flowers, slender, erect or rambling. Leaves $2\frac{1}{2}$ by 1 in. (occasionally up to 5 by 3 in.), ovate, acuminate; petiole $0\frac{1}{2}$ in. long, or in the lower leaves 1–2 in. Peduncles slender; cymes loose; upper peduncles running into large loose panicles; bracts to the flowers minute, linear; floral leaves at the base of peduncles often $\frac{1}{2}$ –1 in. long, ovate. Sepals $\frac{1}{8}$ – $\frac{1}{6}$ in. long, linear, pubescent or nearly glabrous. Corolla $\frac{1}{3}$ – $\frac{1}{2}$ in. long. One anther-cell below the other, tailed. Pollen ellipsoid, with 3 stopples and longitudinal rows of spots. Capsule $\frac{2}{3}$ in. long, shortly hairy all over, 4-seeded; stalk $\frac{1}{4}$ in. long, slender; placentæ not rising elastically; seeds covered with long scabrous tubercles.—*Roxb. Fl. Ind.* ed. Carey & Wall. i. 132; *T. Anders. in Journ. Linn. Soc.* vii. 44 (including var. *pubescens*). *Rhaphidospora glabra*, *Nees in Wall. Plant. As. Rar.* iii. 115, and in *DC. Prod.* xi. 499; *Wight, Ic. t.* 1554; *Solms-Laub. in Schweinf. Beitr. Fl. Aethiop.* 244; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 329, and in *Engl. Pfl. Ost-Afr. C.* 370. *R. abyssinica*, *Nees in DC. Prod.* xi. 500; *A. Rich. Tent. Fl. Abyss.* ii. 161. *Gendarussa dichotoma*, *Hochst. ex Nees in DC. Prod.* xi. 508.

Nile Land. Eritrea: Embat Kalla, 4500 ft., *Schweinfurth & Riva*, 2002! Bogos, *Hildebrandt*, 697! and Keren, *Steudner*, 1519! Abyssinia: Valley of the Tacazze, *Schimper*, 903! and without precise locality, *Schimper*, 184! British East Africa: Taita, *Hildebrandt*, 2533!

Mozamb. Dist. Zanzibar, *Hildebrandt*, 1135! German East Africa: Kilimanjaro, 2000–4000 ft., *Volkens*, 1797! 2187! Usambara; Masheua, *Holst*, 8797! Portuguese East Africa: Lower Zambesi; below Shigogo, *Kirk*! British Central Africa: Nyasaland; between Kondowe and Karonga, 2000–6000 ft., *Whyte*! between Mpata and the Tanganyika Plateau, *Whyte*! Upper Shire Valley, *Kirk*! and without precise locality, *Buchanan*, 707!

70. **J. anselliana**, *T. Anders. in Journ. Linn. Soc.* vii. 44. Stems 12–20 in. long, weak, nearly glabrous. Leaves $1\frac{3}{4}$ by $\frac{1}{6}$ – $\frac{1}{2}$ in., linear to lanceolate (in Ansell's type example, on which are also ovate leaves $\frac{2}{3}$ in. long), glabrous, or very nearly so; petiole $0\frac{1}{8}$ in. long. Peduncles solitary, axillary, distant, slender, nearly glabrous, $\frac{1}{2}$ – $1\frac{1}{2}$ in. long, each terminating in a slender scorpioid 2–8-flowered cyme, $\frac{1}{2}$ – $1\frac{1}{2}$ in. long; bracts or bracteoles shorter than the calyx. Sepals $\frac{1}{8}$ in. long, linear, glabrous or very nearly so. Corolla $\frac{1}{4}$ in. long. One anther-cell below the other, definitely tailed; pollen very small, ellipsoid, with 2 stopples and 2 rows of tubercles on each side of each stopple. Capsule $\frac{1}{3}$ in. long, glabrous, very thin-walled; seeds deeply wrinkled, with a scarious wing on the margin in the West African type plant, becoming gradually obsolete in the Eastern specimens.—*Oliv. in Trans. Linn. Soc.* xxix. 130 (including var. *angustifolia*); *S. Moore in Journ.*

Bot. 1880, 341; and in Trans. Linn. Soc. ser. 2, Bot. iv. 32; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373, partly. *Justicia*, sp. n. 8, T. Thoms. in Speke, Nile Append. 643. *Adhatoda anselliana*, Nees in DC. Prod. xi. 403; Benth. in Hook. Niger Fl. 484. *Dianthera*, sp., Benth. in Benth. et Hook. f. Gen. Pl. ii. 1114.

Upper Guinea. Liberia; Cape Palmas, *Ansell!* Lower Niger, Ibu (Abo), *Vogel, 14!*

Nile Land. British East Africa: Bongo; Sabbi River, *Schweinfurth, 2646!* Madi, *Speke & Grant*, Kavirondo, *Scott-Elliot, 7123!* Kariandusi River, near Lake Elmeteita, 6000 ft., *Scott-Elliot, 6633!* Lake Nukura, 6000 ft., *Scott-Elliot, 6810!* Kamasia, west of Lake Baringo, *Gregory!*

Lower Guinea. Angola: Pungo Andongo, *Welwitsch, 5098! 5172! 5173!*

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau at Fort Hill, 3500 ft., *Whyte!* Shire Highlands, *Buchanan, 483!* Mount Mlange, *Whyte!* and without precise locality, *Buchanan, 876! 1385!*

71. **J. matammensis**, *Oliv. in Trans. Linn. Soc. xxix. 130.* More pubescent in all parts than *J. anselliana*, and leaves not linear. Leaves (in Schweinfurth's type plant) up to $2\frac{1}{2}$ by 1 in., in many Zambesi examples 1 by $\frac{1}{3}$ – $\frac{2}{3}$ in.; petioles of upper leaves with prominent long lax hair. Peduncles more or less pubescent. Capsule often hispid in the upper part; otherwise as *J. anselliana*.—*Oliv. l.c. ser. 2, Bot. ii. 345;* Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373. *J. anselliana*, Lindau in Engl. Pfl. Ost-Afr. C. 373 mainly, and in Engl. & Prantl, Pflanzenfam. iv. 3B. fig. 112, D, E. *Justicia*, spp. n. 2–4, T. Thoms. in Speke, Nile Append. 643. *Adhatoda matammensis*, *Schweinf. in Verh. Zool.-Bot. Gesell. Wein, xviii. (1868) 674.*

Nile Land. Upper Senaar: Fazokl, *Figari!* Gallabat: Matamma, *Schweinfurth, 130c!* British East Africa: Niamniam, *Schweinfurth, 3883!* Upper Nile, *Freeman & Lucas!* Buddu; Buganga, *Scott-Elliot, 7454!* Kikuyu, *Scott-Elliot, 6543!* Ukamba, *Scott-Elliot!* 6343! Taita, *Hildebrandt, 2840! 2854!* *Gregory!* Duruma, *Gregory!*

Lower Guinea. German South-west Africa: Amboland, *Schinz, 13! 35!*

South Central. Monbuttu: Munza, *Schweinfurth, 3459!* Lunda: Lulua River, *Pogge, 305, 307, 308!* and Lomani River, *Pogge, 1013!*

Mozamb. Dist. Zanzibar, *Hildebrandt, 980!* German East Africa: Kili-manjaro, *Volkens, 512! 532! 916!* *Johnston!* Karagwe; Bukoba, *Stuhlmann, 3296!* Usukuma: Seke country, *Stuhlmann, 4195!* Unyamwezi, *Speke & Grant!* Usambara: Lutindi, *Holst, 3432!* Amboni, *Holst, 2809!* Nyika, *Holst, 579A!* Kisokwe, *Hannington!* Portuguese East Africa: Lower Zambesi; Shupanga, *Kirk!* Lower Shire Valley, *Kirk,* British Central Africa: Nyasaland, Zomba and vicinity, 2500–3500 ft., *Whyte!* Matabeleland, *Elliot!* Rhodesia; Tamasanka, *Holub, 1208! 1209! 1210!*

Holst, 3432, 8865, named by Lindau's hand *J. anselliana*, I think nearly typical *J. matammensis*. Though the two species are closely allied, I have no difficulty in separating them; but I doubt whether some of the small (and small-leaved) plants referred here should not rather be sorted with *J. uncinulata*.

72. **J. uncinulata**, *Oliv. in Trans. Linn. Soc.* xxix. 130, t. 129, fig. A. Rootstock woody; branches 4–6 in. long. Leaves $\frac{1}{2}$ – $\frac{2}{3}$ by $\frac{1}{4}$ in., elliptic or ovate; upper petioles thinly hispid. Capsule barely $\frac{1}{4}$ in. long, hispid near the top, shorter and broader than that of *J. matammensis*.—Lindau in *Engl. Pfl. Ost-Afr. C.* 373. *Justicia*, sp. n. 5, T. Thoms. in *Speke, Nile Append.* 543.

Nile Land. Somaliland, *Mrs. Lort-Phillips!* Uganda, *Stuhlmann*, 1334!

Mozamb. Dist. German East Africa: Kilimanjaro, *Smith!* Usambara, *Holst*, 8950! Usagara; on the Robeho Mountains, 4700 ft., *Speke & Grant!*

Var. *tenuicapsa*, C. B. Clarke. Capsule slender, glabrous.

Nile Land. British East Africa: Upper Nile, *Freeman & Lucas*, 79! Karian-dusi River, near the south end of Lake Elmeteita, 6000–7000 ft., *Scott-Elliot*, 6628! Mau, 7000 ft., *Scott-Elliot*, 6852! and on dry plains near Lake Naivasha, *Scott-Elliot*, 6521!

Mozamb. Dist. German East Africa: Kilimanjaro; Marangu, 5000 ft., *Volkens*, 916! Karagwe, 5200 ft., *Stuhlmann*, 1864! Mwansa, on Lake Victoria, at Smith Sound, *Stuhlmann*, 4520! and without precise locality, *Fischer*, 32! 305!

These small plants, as to leaves, hairs and flowers, agree with *J. uncinulata*, but the capsules are those of *J. anselliana*. The example of Freeman & Lucas is annual, 11 in. long, and has small (many abnormal) flowers.

73. **J. crassiradix**, C. B. Clarke. Nearly glabrous. Rhizome creeping in swamps, scaly; proper roots many, long, cylindrical, thick. Stems erect, 6–10 in. long. Leaves distant, 2 by $\frac{1}{6}$ in., obtuse, sessile, erect. Sepals up to $\frac{1}{4}$ in. long, nearly glabrous. Corolla $\frac{1}{2}$ in. long. Pollen with 3 stopples, no tubercles.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, *Carson*, 62, 68, and 107 of 1893 collection!

Var. ? *hispida*, C. B. Clarke. Whole plant (leaves on both surfaces) hispid. Capsule $\frac{1}{3}$ in. long, hispid at the top. Rhizome not seen in this variety.

Nile Land. 40–60 miles from the coast (Mombasa), *Johnston!*

Mozamb. Dist. British Central Africa: Nyasaland, Shire Highlands, *Buchanan*, 461!

The habit, leaves, and flowers resemble those of *J. crassiradix*.

74. **J. Nuttii**, C. B. Clarke. Stems 15 in. long, straight, undivided, sparingly hispid; internodes 3 times as long as the leaves. Leaves up to 1 by $\frac{2}{3}$ in., ovate, thinly hispid, base truncate or rounded, tip triangular; petiole hardly any or in lowest leaves up to $\frac{1}{10}$ in. long. Peduncles few, penultimate, 1–3 in. long, 2-flowered; bracts $\frac{1}{8}$ in. long, linear. Sepals nearly $\frac{1}{3}$ in. long, linear, minutely and very sparsely scabrous. Corolla nearly $\frac{1}{2}$ in. long. Pollen ellipsoid; stopples 2, with one row of tubercles beside each.

Mozamb. Dist. German East Africa: between Lake Tanganyika and Lake Rukwa, 6000 ft., *Nutt!*

This is a distinct, strongly marked species.

Var. β . *blantyreensis*, C. B. Clarke. Stem and leaves very hispid. Leaves up to 2 by 1 in.

Mozamb. Dist. British Central Africa: Nyasaland; Blantyre, *Buchanan*, 20! 165!

Buchanan, 20, was an erect plant, $1\frac{1}{2}$ ft. high, with penultimate peduncles; *Buchanan*, 165, appears prostrate or against a rock, with remote axillary divaricated peduncles.

Imperfectly known species.

75. **J. Hoepfneri**, *Lindau in Engl. Jahrb.* xx. 66. Under-shrub. Leaves $\frac{1}{2}$ in. long, linear-lanceolate or linear, glabrous. Flowers solitary, axillary; bracteoles $\frac{1}{4}$ in. long, lanceolate, finely hairy. Calyx $\frac{1}{4}$ in. long. Corolla nearly $\frac{1}{2}$ in. long. Capsule $\frac{1}{4}$ in. long, sparsely hairy. Seeds 4, almost smooth.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 349.

Lower Guinea. Angola: Mossamedes, *Hoepfner*, 10.

This would appear to be *Monechma Salsola*, or near it, but *Lindau* especially says the seeds are 4. The one example cited was not found by me in the Berlin Herbarium.

76. **J. Romanixæ**, *Schweinf. & Volkens, Liste Pl. Somalis*, 17. Shrub; branchlets glabrous. Leaves $\frac{2}{5}$ by $\frac{1}{8}$ in., oblanceolate, glabrous, subsessile. Flowers axillary, solitary; bracts minute, ciliate. Sepals $\frac{1}{8}$ in. long. Corolla $\frac{1}{3}$ in. long, yellow. Lower anther-cell spurred.—*Ghika, Pays des Somalis*, 217.

Nile Land. Somaliland: Salul Torrent, *Ghika*.

No specimen at Kew.

Perhaps near *J. odora*, Vahl.

77. **J. Mannii**, *T. Anders. in Journ. Linn. Soc.* vii. 44. Shrub. Leaves 3–6 by 1–3 in., ovate, glabrous; petiole 1 in. long. Spikes axillary 2, 1 in. long, loose, glabrous, few-flowered; bracts $\frac{1}{5}$ in. long, linear, acute. Sepals shorter than the bracts, ovate-lanceolate. Corolla $1\frac{1}{4}$ in. long, purple. Anther-cells muticous. Ovary glabrate, 4-ovuled.

Upper Guinea. Fernando Po, *Mann*.

Justicia Mannii, T. Anders. MS. in Herb. Kew, is *Adhatoda orbicularis* (*Lindau* sub *Duvernoiá*). It is evident that T. Anderson applied the name *Justicia Mannii* to two widely different plants, and probably cancelled one of them himself.

78. **J. Poggei**, *Lindau in Engl. Jahrb.* xx. 61. Leaves up to $3\frac{1}{2}$ by $1\frac{1}{4}$ in., narrowed at either end, slightly hairy; petiole short. Spikes terminal and axillary, dense; bracts $\frac{1}{2}$ by $\frac{1}{3}$ in., ovate, cuspidate, thinly hispid, margin scarious; bracteoles nearly $\frac{1}{3}$ in. long, oblong. Sepals $\frac{1}{8}$ – $\frac{1}{6}$ in. long, hairy. Corolla $\frac{1}{3}$ in. long, glabrous. One anther-cell lower than the other, with a very small spur.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 350.

South Central. Lunda: Mussumba, *Pogge*, 304.

Fruit not seen, but I suspect the genus to be *Rungia*.

79. **J. guerkeana**, *Schinz in Verh. Bot. Ver. Brandenb.* xxxi. (1889) 201. Nearly glabrous. Branchlets woody; internodes $\frac{1}{2}$ in. long. Leaves $1\frac{1}{2}$ by $\frac{1}{6}$ in., linear-oblong, tapering at the base, subsessile. Spike terminal, 2–3 by $\frac{3}{4}$ in.; upper bracts strobilate, lower separate, 1-flowered

(1-3-flowered ex *Schinz*), nearly $\frac{1}{2}$ by $\frac{1}{4}$ in., roundish, short-acuminate, with a prominent scarious margin; bracteoles $\frac{1}{4}$ in. long, lanceolate. Sepals 5, $\frac{1}{6}$ in. long, linear-lanceolate, nearly glabrous. Corolla $\frac{1}{3}$ in. long. One anther-cell below the other, strongly tailed; pollen ellipsoid, with 2 stopples; a single row of minute (but pointed) tubercles on each side of each stopple.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349.

Lower Guinea. German South-west Africa: Great Namaqualand; between Tiras and Rehoboth, *Schinz*!

There is no fruit; possibly a *Rungia*.

80. **J. somalensis** (*Franch. Sert. Somal.*, 53). Small shrub; branches slender, crispedly pubescent. Leaves obovate - oblong or obovate, obtuse, sparingly adpressedly puberulous; petiole short. Racemes lax; flowers solitary, between 2 ovate or orbicular almost membranous subsessile ciliate bracts; bracteoles subulate. Calyx 5-partite nearly to the base; segments linear. Corolla $\frac{1}{4}$ - $\frac{1}{3}$ in. long, concealed by the 2 flatly adpressed bracts as in *Dicliptera*, purple, pubescent without; tube not longer than the calyx; limb distinctly 2-lipped; upper lip narrow, 2-toothed, lower spreading. Stamens 2; lower anther-cell long-tailed. Capsule clavate, pubescent; cells 2-ovuled; seeds orbicular, flat.

Nile Land. Somaliland: Mana, *Révoil*.

44. **MONECHMA**, Hochst. in Flora, 1841, 374.

Sepals 5, small, narrow, posticous one sometimes much smaller. Corolla small, 2-lipped; posticous lip subentire. Stamens 2; one anther-cell below the other, long-tailed, tail often clavate, 2-fid at tip; pollen ellipsoid, longitudinally banded, with or without rows of tubercles. Ovary slightly hairy near the top; ovules 1-2 in each cell; style hairy at the base, subequally and shortly 2-lobed at the top. Capsule small, ellipsoid, 2-seeded, compressed, hairy (except in *M. lolioides*), on a short solid stalk or subsessile; placentæ not rising elastically from the base of the valves; seeds discoid, quite smooth without tubercles or corrugations, usually glabrous, rarely with minute hairs.—Leaves entire. Spikes strobilate or lax, or flowers axillary and solitary; bracts ovate to linear-oblong; bracteoles minute or 0.

Species 21, African; one extending through Arabia to Bombay.

The present genus is not equivalent to *Justicia*, Sect. iv. *Monechma*, Lindau (in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349), which includes several species which do not satisfy Hochstetter's characters for *Monechma*. The genus, as here understood, differs from *Justicia* by the capsule having two smooth seeds; it is *Schwabea* of Nees and Bentham, not of Endlicher (which had 4 stamens and did not belong to the tribe *Eu-Justicieæ*).

*SCHWABEA.—Seeds with a tuft of rigid many-celled thick hairs at the hilum, and a similar tuft at the opposite margin.

Inflorescence hispid with long white hairs 1. *M. hispidum*.

**EU-MONECHMA.—Seeds (without tufts of hairs) glabrous, or with very minute scattered hairs.—*Justicia*, Benth. in Benth. et Hook. f. Gen. Pl. ii. 1109, partly.

Spikes strobilate, terminal and also on short pseudo-axillary peduncles; bracts ovate, enclosing the calyx.

Bracts not viscous glandular.

Bracts round, ciliate on the margins 2. *M. bracteatum*.

Bracts elliptic acute, scabrous on the nerves 3. *M. scabrinerve*.

Bracts viscous glandular.

Tip of bracts triangular, hardly acute 4. *M. Welwitschii*.

Tip of bracts acuminate 5. *M. tettense*.

Spikes terminal; bracts from narrow-elliptic to linear-oblong.

Leaves ovate, elliptic, or broadly oblong.

Leaves nearly sessile.

Leaves ovate, rounded at the base 6. *M. subsessile*.

Leaves oblong-elliptic, narrowed to the base 7. *M. varians*.

Leaves with petioles rarely exceeding $\frac{1}{4}$ – $\frac{1}{3}$ in. in length.

Bracts not marginate 8. *M. depauperatum*.

Bracts with pale margins 9. *M. scabridum*.

Leaves with petioles $\frac{1}{3}$ – $\frac{1}{2}$ in. long; bracts marginate 10. *M. marginatum*.

Leaves linear to linear-oblong 11. *M. lolioides*.

Flowers solitary, axillary, running almost or quite into spikes at the ends of the branches; leaves and bracts (or floral leaves) lanceolate, mucronate or apiculate.

Leaves and bracts glabrate 12. *M. genistifolium*.

Leaves and bracts long-white-hairy on the margins.

Leaves 1 in. long; sepals $\frac{1}{4}$ in. long 13. *M. arenicola*.

Leaves $\frac{1}{2}$ in. long; sepals $\frac{1}{8}$ in. long 14. *M. Desertorum*.

Flowers scattered, all (or nearly all) solitary; leaves hairy.

Flowers sessile.

Leaves scarcely acute.

Leaves 2 in. long 15. *M. Nepeta*.

Leaves $\frac{1}{2}$ in. long.

Branches 12–15 in. long; many internodes exceeding 1 in. in length 16. *M. floridum*.

Branches short; internodes $\frac{1}{20}$ – $\frac{1}{5}$ in. in length 17. *M. spissum*.

Leaves rigid, acute or mucronate.

Leaves ultimately glabrate 18. *M. Salsola*.

Leaves thinly hairy 19. *M. hereroense*.

Flowers on axillary pedicels $\frac{1}{20}$ – $\frac{1}{5}$ in. long. 20. *M. cleomoides*.

1. **M. hispidum**, Hochst. in *Flora*, 1841, 375, 1843, 76. Annual 1–2 ft. high, hispid-scabrous or glabrate. Leaves up to 3 by $\frac{1}{2}$ – $\frac{3}{4}$ in., entire, harsh, base narrowed; petiole $\frac{1}{12}$ – $\frac{1}{4}$ in. long. Spikes (in fruit) up to 3–4 by $\frac{3}{4}$ in. (exclusive of the bracts); bracts $\frac{1}{2}$ –1 in. long, oblong, the lower leaf-like, petioled, up to 1 $\frac{1}{2}$ –2 in. long; bracteoles $\frac{1}{2}$ – $\frac{3}{4}$ in. long, with conspicuous long white stiff hairs. Sepals 5, subequal, nearly distinct, $\frac{1}{3}$ in. long, linear, hispid. Corolla hardly exceeding $\frac{1}{2}$ in. in length, white slightly purple-spotted, 2-lipped, as of the smaller *Justicias*. Stamens 2; one anther-cell below the other, white-tailed; pollen

ellipsoid, banded, stopples 2, no tubercles. Capsule $\frac{1}{3}$ in. long, woody; seeds $\frac{1}{6}$ by $\frac{1}{10}$ in.—*Justicia ciliaris*, Linn. f. Suppl. 84; Jacq. Hort. Vind. ii. 47, t. 104 (*ciliata*). *J. Büttneri*, Lindau in Engl. Jahrb. xx. 68, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349. *Pogonospermum ciliare* and *P. hispidum*, Hochst. in Flora, 1844, Beil. 6. *Schwabea ciliaris*, Nees in DC. Prod. xi. 384, excluding syn. Endl.; A. Rich. Tent. Fl. Abyss. ii. 154; Benth. in Hook. Niger Fl. 482; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 113; T. Anders. in Journ. Linn. Soc. vii. 45; Oliv. in Trans. Linn. Soc. xxix. 130; Lindau in Engl. Jahrb. xviii. 64, t. 2, fig. 98, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 346, and in Engl. Pfl. Ost-Afr. C. 372. *S. spicigera*, Nees in DC. Prod. xi. 384; T. Anders. in Journ. Linn. Soc. vii. 45.

Upper Guinea. Senegambia, *Heudelot*, 167! 505 partly! Gambia, *Brown-Lester*, 51! Sierra Leone: near Bayabaya on the Scarcies River, *Scott-Elliott*, 4588! Togoland, *Büttner*, 148! *Baumann*, 326!

Nile Land. Kordofan, *Kotschy*, 239! *Pfund*, 83! Gallabat, *Schweinfurth*, 14! 81! 84! British East Africa: Jur: Jur Ghattas, *Schweinfurth*, 2463! Madi, *Speke & Grant*!

Mozamb. Dist. British Central Africa: Nyasaland: between Kondowe and Karonga, 4000–6000 ft., *Whyte*, 381!

Nees says the flowers are axillary and solitary in *Pogonospermum ciliare*, but spiked in his *Schwabea spicigera*: he has written on one example of *Heudelot's ciliaris*, on another *spicigera*, and they look to me one collection. The spikes when young in *Pogonospermum* are dense, but they open out much in fruit; the bracts show a passage from leaf to bract, and are throughout the spike so very long and leaf-like in this genus that they might be described as floral leaves. Lindau says the pollen is tubercled; I find it unusually devoid of rows of tubercles, or even of spots.

2. **M. bracteatum**, *Hochst. in Flora*, 1841, 375, 1843, 75. Stems 1–3 ft. high, pubescent. Leaves up to $4\frac{1}{2}$ by $1-1\frac{1}{2}$ in. (usually much smaller), when mature glabrate or puberulous, tip obtuse; petiole $\frac{1}{2}$ –1 in. long. Spikes sessile (sometimes more than 2 at one node), 2 by $\frac{2}{3}$ in., strobilate; bracts $\frac{1}{4}$ – $\frac{1}{3}$ in. in diam., circular or slightly elliptic, obtuse (sometimes with a minute point), pubescent, ciliate with long white several-celled hairs round the margin nearly or quite to its summit (but see var. enumerated below). Calyx $\frac{1}{5}$ in. long, hairy. Corolla $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Lower anther-cell with a long tail, obtuse subclavate at the tip. Capsule $\frac{1}{4}$ in. long, densely clothed with short white (mostly deflexed) hairs; seeds yellow-brown often with black blotches.—Nees in DC. Prod. xi. 411; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 112, 244; Zarb, Cat. Spéc. Bot. Pfund. 32. *M. affine*, Hochst. in Flora, 1843, 76; Nees in DC. Prod. xi. 411; A. Rich. Tent. Fl. Abyss. ii. 158. *M. debile*, Nees in DC. Prod. xi. 411; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 112, 224. *Dianthera debilis*, Forsk. Fl. Ægypt.-Arab. 9. *Justicia debilis*, Vahl, Symb. ii. 15, and Enum. i. 135; T. Anders. in Journ. Linn. Soc. vii. 43; Engl. Hochgebirgsfl. Trop. Afr. 393; Oliv. in Trans. Linn. Soc. xxix. 129; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3B. 349, fig. 139, q, in Engl. Pfl. Ost-Afr. C. 373, and in Ann. Istit. Bot. Roma vi. (1896) 83. *J. bracteata*, Zarb, Cat. Spéc. Bot. Pfund. 32. *J. blepharostegia*, T. Thoms. in Speke, Nile Append. 643.

J. Gregorii, S. Moore in Journ. Bot. 1894, 138; Lindau in Engl. Pfl. Ost-Afr. C. 373. *J. albiflora*, Ehrenberg MS., not of Blume. *Gendarussa debilis*, Nees in Linnæa xvi. 302.

Nile Land. Kordofan, *Kotschy*, 261! 759! *Pfund*, 167! Darfur, *Pfund*, 424! Ethiopia, *Kotschy*, 49! Galabat: Matamma, *Schweinfurth*, 124! Eritrea: Keren! *Steudner*, 1520! Bogos, 5000 ft., *Hildebrandt*, 441! Abyssinia: Eilet, *Ehrenberg*! Wadi Togodele, *Ehrenberg*! Gageros, 3500 ft., *Schimper*, 179! Gapdia, *Schimper*, 759! and without precise locality, *Schimper*, 419! 749! 756! Somaliland: Adda Galla, *James & Thrupp*! Ogaden, *Riva*, 339! Berbera, *Robecchi*, 243, and without precise locality, *Miss Edith Cole*! *Mrs. Lort-Phillips*! British East Africa: near Lake Baringo, *Gregory*!

Mozamb. Dist. German East Africa: Karagwe, *Speke & Grant*, 433! Kilimanjaro, *Volkens*, 2175! Usambara, *Holst*, 10! Ukami; Mrogoro, 1600 ft., *Stuhlmann*, 8200! Unyamwezi; Iramba District, *Stuhlmann*, 4217! British Central Africa: Nyasaland; Tanganyika Plateau at Fort Hill, 3000–4000 ft., *Whyte*! between Kondowe and Karonga, 2000–6000 ft., *Whyte*, 94!

Var. β *hirsutior*, C. B. Clarke. Stem very hairy. Mature leaves hairy beneath; bracts densely white, ciliate on the margin.—*Justicia debilis*, Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 345.

Nile Land. British East Africa: Taita; Maungu Mountain, *Johnston*! and Ndara Mountain, *Hildebrandt*, 2397. Ukamba, 5000–6000 ft., *Scott-Elliot*, 6749!

Mozamb. Dist. German East Africa: Usambara, Kwa Mshuza, *Holst*, 8991!

All the specimens of this have dried a very dark green instead of the grey yellow-green of typical *M. bracteatum*.

Var. γ *angustifolia*, C. B. Clarke. Leaves narrower, in an extreme form 5 by $\frac{1}{8}$ in.—*M. angustifolium*, Nees in DC. Prod. xi. 412. *Justicia blepharostegia*, Drège, Zwei Pfl. Docum. 160, 195; T. Anders. in Journ. Linn. Soc. vii. 43.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi, near Sena, *Kirk*! British Central Africa: Nyasaland; Shire River, *Kirk*!

Var. δ *non-strobilifera*, C. B. Clarke. Flowers 3–1 clustered in distant leaf-axils; upper clusters approximate.

Nile Land. Eritrea: Habab, 6000 ft., *Hildebrandt*, 442!

Mozamb. Dist. British Central Africa: Nyasaland; Kondowe to Karonga, 2000–6000 ft., *Whyte*!

Var. ϵ *stricta*, C. B. Clarke. Bracts elliptic-oblong; spikes narrower.

Nile Land. Eritrea: Keren, *Steudner*, 1499! Abyssinia, *Schimper*, 207! 511! 876! *Steudner*, 1521!

Var. ζ *eciliata*, C. B. Clarke. Bracts without cilia; otherwise as typical *M. bracteatum*, Hochst.

Nile Land. Eritrea: near Ginda, 3300 ft., *Schweinfurth & Riva*, 2195!

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte*! 135! 118B!

Also in Arabia.

3. **M. (?) scabrinerve**, C. B. Clarke. Leaves 2 by $\frac{3}{4}$ in., reticulate beneath by prominent nerves (both primary and secondary), minutely scabrous. Bracts $\frac{1}{3}$ by $\frac{1}{6}$ in., elliptic, acute, scabrous-nerved and with a few long white simple hairs; otherwise as typical *M. bracteatum*.

Nile Land. British East Africa: near Lake Elmeteita, 6000 ft., *Scott-Elliot*, 6676!

Flowers not seen; hence, if anthers prove without tails, this may be an *Ecbolium* near *E. anisacanthus*.

4. **M. Welwitschii**, *C. B. Clarke*. Bracts ovate, triangular acute at the tip, viscous-hairy; sepals with some gland-tipped hairs; otherwise as *M. bracteatum*.—*Justicia monechmoides*, S. Moore in *Journ. Bot.* 1880, 311.

Lower Guinea. Angola: Loanda, *Welwitsch*, 5065! 5123, 5140! 5184!

S. Moore says that *Monechma* is characterised by having the spikes in opposite axils, a character not often seen in the present plant. In *Monechma* the spikes are not always in opposite axils, while in the present plant they are so sometimes.

5. **M. tettense**, *C. B. Clarke*. Leaves elongate. Bracts (especially the lower ones) ovate, acuminate; otherwise as *M. Welwitschii*.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; Kaimba Island, opposite Tete, *Kirk*! Shupanga, *Kirk*! British Central Africa: Nyasaland, *Buchanan*, 438! Lake Nyasa, *Simons*!

One anther much below the other, with a long tail, obtuse emarginate at the tip.

6. **M. sessile**, *C. B. Clarke*. Rootstock woody; branches 10 in. long, simple, hairy. Leaves $1\frac{1}{4}$ by $\frac{3}{4}$ in., ovate, scabrid on the nerves beneath, base obtuse or subcordate; petiole $0-\frac{1}{10}$ in. long. Spike terminal, 2 by $\frac{3}{4}$ in., dense; bracts $\frac{2}{3}-\frac{3}{4}$ by $\frac{1}{4}$ in., elliptic-lanceolate, subacute, minutely hairy, not marginate; bracteoles 2, $\frac{2}{3}$ in. long, broadly oblong. Sepals 5, $\frac{1}{3}$ in. long, linear, posticous one a little (or considerably) shorter. Corolla $\frac{3}{4}$ in. long, yellow with 2 pink streaks down the throat. Filaments glabrous; one anther-cell below the other, with a long clavate tail, 2-3-toothed at the tip; pollen ellipsoid, banded longitudinally, with 2 stopples, and no tubercles. Ovary shaggy. "Capsule containing only 2 flat seeds" (*Oliver*).—*Justicia sessilis*, Oliv. in *Trans. Linn. Soc.* xxix. 129, t. 129, fig. B; Lindau in *Engl. Pfl. Ost-Afr. C.* 373. *Justicia*, sp. n. 3, T. Thoms. in *Speke, Nile Append.* 643.

Mozamb. Dist. German East Africa: Karagwe, *Speke & Grant*, 213!

Prof. Oliver says this was his t. 129, fig. A, whereas it was t. 129, fig. B. Inside the two large "bracteoles" there is sometimes (as correctly drawn by Prof. Oliver) an extra small bracteole, indicative of an undeveloped cyme.

7. **M. varians**, *C. B. Clarke*. Rootstock woody; stems up to 18 in. long, with erect branches, more or less hairy. Leaves up to 2 by $\frac{1}{2}$ in., acute at either end, sessile. Spikes terminal, $1\frac{1}{4}$ by $\frac{2}{3}$ in. dense; bracts up to $\frac{1}{2}$ by $\frac{1}{8}$ in., oblong-elliptic, obtuse, hairy or nearly glabrous, not marginate; bracteoles up to $\frac{1}{3}$ in. long, linear, somewhat obovate-oblong (or one of these bracteoles may be the true flower bract). Sepals 5, whereof 4 are $\frac{1}{4}$ in. long, linear, minutely hairy (many hairs gland-tipped), the posticous sepal hardly $\frac{1}{10}$ in. long. Corolla scarcely

$\frac{1}{2}$ in. long. Filaments glabrous; anther-cells round, one obliquely above the other, short-tailed, tail of the lower cell of medium length, terete, obtuse; pollen ellipsoid, without distinct tubercles. Ovary glabrous when young; style very thinly hairy.

Mozamb. Dist. British Central Africa: Nyasaland, 2000–7000 ft. *Whyte!*

Twice collected; examples at 6000–7000 ft., hairy all over; those at 2000–6000 ft. nearly glabrate.

8. **M. depauperatum**, *C. B. Clarke*. Stem 3–5 ft. high; branches more or less angular and hairy. Leaves up to 3 by 1 in., elliptic-lanceolate, subacute at either end, sparsely hairy or glabrate above, hairy on the nerves beneath; petioles 0– $\frac{1}{8}$ in. long. Spikes $1\frac{1}{2}$ –4 in. long, elongated in fruit, terminal; bracts $\frac{1}{2}$ by $\frac{1}{8}$ – $\frac{1}{6}$ in., elliptic or oblong, obtuse or subacute, minutely pubescent, not margined; bracteoles 0. Sepals 5, subequal, $\frac{1}{6}$ – $\frac{1}{4}$ in. long, linear-lanceolate, minutely pubescent. Corolla $\frac{1}{2}$ in. long, pale yellow (*Barter*). Filaments glabrous; anther-cells ellipsoid, one much below the other, long-tailed, tail clavate sub-bifid at the tip; pollen ellipsoid, banded, with 2 stopples, one row of depressed tubercles (scarcely more than patches) on each side of each stopple. Capsule nearly $\frac{1}{2}$ in. long, 2-seeded, minutely pubescent to the base; placentæ not rising elastically; seeds smooth, shining, with scattered small simple white hairs.—*Justicia depauperata*, T. Anders. in Journ. Linn. Soc. vii. 40. *J. Barteri*, T. Anders. in Journ. Linn. Soc. vii. 39. *J. sexsulcata*, Lindau in Engl. Jahrb. xx. 67, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349.

Upper Guinea. Sierra Leone: Lomaburn, *Scott-Elliot*, 5035! interior of West Lagos, *Rowland!* Togoland, *Büttner*, 202! Lower Niger: Onitsa, *Barter*, 592! 1380!

9. **M. scabridum**, *C. B. Clarke*. Leaves often obtuse at the base, minutely hairy on the lower face. Bracts margined, sometimes green on the back, with scarious green-yellow prominent margins. Seeds with more numerous hairs, sometimes densely hairy near the margins; otherwise as *M. depauperatum*.—*Justicia scabrida*, S. Moore in Journ. Bot. 1880, 310. *J. marginata*, Lindau in Engl. Jahrb. xx. 73, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5085! 5092! Malange, *Büttner*, 33!

Experienced botanists have united this in the herbarium with *M. depauperatum*. I doubt much if it should be specifically separated.

10. **M. marginatum**, *C. B. Clarke*. Leaves up to 5 by $1\frac{1}{2}$ in., narrowed at both ends; petioles up to $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Bracts $\frac{1}{2}$ in. long, or rather more, very acute, with broad scarious-yellow margins; otherwise as *M. depauperatum*.—*Nicoteba marginata*, Lindau in Engl. Jahrb. xxii. 119.

Upper Guinea. Cameroons: Yaunde, *Zenker & Staudt*, 556!

This is put in a different genus from the 3 preceding species by Lindau on the ground that there are no tubercles on the pollen. I think it is hardly specifically

separable; but this is no argument against the value of pollen as a generic character, for the pollen in the 4 species is the same.

11. **M. lolioides**, *C. B. Clarke*. Nearly glabrous, except the corolla; branches 12–20 in. long. Leaves from oblong ($1\frac{3}{4}$ by $\frac{1}{3}$ in.) to linear ($2\frac{1}{2}$ by $\frac{1}{6}$ in.), subobtuse, sessile. Spikes terminal, up to 5 by $\frac{1}{2}$ in., loose, especially at the base, main rhachis glabrous; bracts $\frac{1}{3}$ by $\frac{1}{16}$ in., green with white margins, glabrous. Sepals 5, similar to the bracts but rather shorter. Corolla $\frac{1}{2}$ in. long. Lower anther-cell long-tailed, tail clavate 2-lobed at tip; pollen ellipsoid, with 2 stopples. Style-base hairy; ovary glabrous. Capsule $\frac{1}{3}$ in. long, 2-seeded, glabrous; the solid thick stalk scarcely $\frac{1}{16}$ in. long; seeds yellow-brown, smooth, as of the genus, but with minute white hairs round the margins.—*Justicia lolioides*, *S. Moore* in *Journ. Bot.* 1880, 310, t. 214, fig. 1.

Lower Guinea. Angola: Pungo Andongo and Huilla, *Welwitsch*, 5090! 5178! 5099!

12. **M. genistifolium**, *C. B. Clarke*. Branches round, densely and minutely tomentose. Leaves up to 2 by $\frac{1}{3}$ in., lanceolate, acute, mucronate, sessile, glabrous, yellow-green. Spikes up to $1\frac{1}{2}$ by $\frac{3}{4}$ in., approximate towards the end of the branches; bracts $\frac{3}{4}$ by $\frac{1}{4}$ in., broad-lanceolate, acute, mucronate, glabrous. Sepals 5, $\frac{1}{3}$ in. long, linear, puberulous. Corolla $\frac{2}{3}$ in. long, blue and white (*Lindner*). One anther-cell much below the other, with a long clavate tail sub-2-lobed at the tip; pollen ellipsoid, banded, with 2 stopples. Ovary minutely pubescent in the upper half. Capsule nearly $\frac{1}{2}$ in. long, pubescent, 2-seeded; the solid broad stalk $\frac{1}{6}$ in. long; seeds smooth, with acute margin.—*Justicia genistifolia*, *Engl.* in *Engl. Jahrb.* x. 264; *Lindau* in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349.

Lower Guinea. German South-west Africa: Hereroland, *Luderitz*, 96! Otyitambi, *Belck*, 9! Damaraland; Karibib, 3000 ft., *Marloth*, 1424! *Lindner*!

The bracts are simply shortened leaves, and should perhaps be described as floral leaves.

13. **M. arenicola**, *C. B. Clarke*. Small shrub; viscous glandular-hairy; branches very thick, much ramified. Leaves 1 by $\frac{1}{4}$ – $\frac{1}{3}$ in., broad-lanceolate, acute, mucronate, subsessile, yellow-green, long-white-hairy, approximate. Flowers axillary, sessile. Sepals $\frac{1}{4}$ in. long, linear, green. Corolla exceeding $\frac{1}{2}$ in. in length. Style hairy at the base; ovary minutely hairy in upper half. Capsule $\frac{1}{2}$ in. long, 2-seeded, minutely hairy; the solid thick stalk $\frac{1}{6}$ in. long.—*Justicia arenicola*, *Engl.* in *Engl. Jahrb.* x. 264; *Lindau* in *Engl. Jahrb.* xix. 151, and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349. *J. Steingröverii*, *Schinz* ex *Lindau* in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 349.

Lower Guinea. German South-west Africa: Hereroland; Usakos and Ubib, *Marloth*, 1247, 1445! Port Mine at Swakop River, *Guerich*, 105, and without precise locality, *Luderitz*, 97!

14. **M. Desertorum**, *C. B. Clarke*. Annual, 5 in. high, white-hairy. Leaves $\frac{1}{2}$ by $\frac{1}{6}$ in., lanceolate, acute, mucronate, sessile, long-

white-hairy on the margins, yellow-green. Spikes $\frac{1}{3}$ – $\frac{2}{3}$ in. long, dense, forming a close panicle; bracts $\frac{1}{3}$ by $\frac{1}{8}$ in., lanceolate, acute, mucronate, long-white-hairy on the margins. Sepals 5, $\frac{1}{8}$ in. long, linear, puberulous. Corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Lower anther-cell with a long acute tail; pollen ellipsoid, banded, with 2 stopples and single rows of tubercles. Ovary minutely pubescent in the upper half. Capsule scarcely $\frac{1}{6}$ in. long, 2-seeded, sparsely hairy in the upper part; the solid thick stalk scarcely $\frac{1}{20}$ in. long; seeds smooth with acute margins.—*Justicia Desertorum*, Engl. in Engl. Jahrb. x. 263; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349.

Lower Guinea. Hereroland: Husab, 1000 ft., *Marloth*, 1462!

15. **M. Nepeta**, *C. B. Clarke*. Stem 6–24 in. long, much branched, with many long soft white spreading hairs; internodes up to 1–2 in. long. Leaves up to 2 by $\frac{1}{4}$ – $\frac{1}{3}$ in., with long hairs, some gland-tipped; petiole 0– $\frac{1}{6}$ in. long. Flowers solitary, axillary, remote. Sepals 5, $\frac{1}{5}$ in. long, linear-oblong, green, glandular-hairy. Corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long, violet-purple. Lower anther-cell with a long oblique simple tail; pollen ellipsoid, with 2 stopples and one row of tubercles on each side of each stopple. Ovary thinly hairy in the upper part. Capsule $\frac{1}{5}$ in. long, 2-seeded, thinly hairy in the upper part; the solid stalk less than $\frac{1}{25}$ in. long; seeds smooth.—*Justicia Nepeta*, S. Moore in Journ. Bot. 1880, 312. *J. mossamedea*, S. Moore in Journ. Bot. 1880, 312.

Lower Guinea. Angola: *Welwitsch*, 5003! 5004! 5136! 5137! 5185! Lorenzo Marques, *Quintas*, 123!

Mozamb. Dist. British Central Africa: Ngamiland; Kwebe, *Lugard*, 172!

16. **M. floridum**, *C. B. Clarke*. Branches 12–15 in. long, with spreading long soft white hairs and some viscid glandular hairs; internodes up to 1–1 $\frac{1}{2}$ in. long, those of branchlets scarcely $\frac{1}{4}$ in. in length. Leaves $\frac{1}{2}$ by $\frac{1}{8}$ in., with long white hair and gland-tipped hairs. Flowers solitary, in nearly all the axils. Capsule $\frac{1}{4}$ in. long, 2-seeded, somewhat hairy in the upper part; the solid thick stalk $\frac{1}{10}$ in. long; seeds smooth.—*Justicia*, sp. nova affinis *J. Nepetæ*, S. Moore in Journ. Bot. 1880, 342.

Lower Guinea. Angola: *Welwitsch*, 5120! Benguela; Bumbo, *Welwitsch*, 5032!

This is very near *M. Nepeta*, differing mainly in the well-marked stalk to the somewhat larger capsule. The small leaves and very numerous flowers might be accidental.

17. **M. spissum**, *C. B. Clarke*. Branches viscous hairy; internodes $\frac{1}{20}$ – $\frac{1}{6}$ in. long. Leaves $\frac{1}{2}$ by $\frac{1}{8}$ in., oblong-elliptic, subacute, nearly sessile, viscous hairy. Flower in the axils of nearly all the leaves. Sepals 5, $\frac{1}{5}$ in. long, subulate, scarious, viscous hairy. Capsule $\frac{1}{6}$ in. long, 2-seeded, hairy; placentæ not rising elastically; stalk solid, very short; seeds discoid, shining, smooth, brown with black blotches.

Lower Guinea. Angola: Loanda, *Welwitsch*, 5066!

No specimen in the Kew Herbarium.

18. **M. Salsola**, *C. B. Clarke*. A viscid-hairy rugged shrub, divaricately much-branched, 1–2 ft. in diam.; branches angular, ultimately glabrate. Leaves $\frac{1}{2}$ by $\frac{1}{6}$ in., linear-lanceolate, acute, hairy, subsessile. Flowers axillary, subsessile. Sepals $\frac{1}{5}$ in. long, linear, green, hairy and glandular. Corolla $\frac{1}{3}$ in. long. Lower anther-cell with a long simple acute tail; pollen ellipsoid, with 2 stopples, and 2 rows of spots (hardly elevated) on each side of each stopple. Capsule $\frac{1}{4}$ in. long, 2-seeded.—*Justicia Salsola*, S. Moore in Journ. Bot. 1880, 340.

Lower Guinea. Angola: Praia da Amelia, *Welwitsch*, 5023!

Allied perhaps to *M. arenicola*, but has much more scattered flowers.

19. **M. hereroense**, *C. B. Clarke*. Undershrub; branches round, densely grey woolly-tomentose; internodes $\frac{1}{2}$ in. long. Leaves $\frac{2}{3}$ by $\frac{1}{12}$ in., lanceolate, mucronate, thinly hairy. Flowers axillary; bracts nearly $\frac{1}{3}$ in. long, lanceolate. Sepals $\frac{1}{6}$ in. long, lanceolate-subulate. Corolla nearly $\frac{1}{2}$ in. long, blue. Lower anther-cell long-tailed. Capsule $\frac{1}{5}$ – $\frac{1}{6}$ in. long, ellipsoid, subacute, sessile, 2-seeded, hairy; seeds discoid, not tubercled.—*Justicia hereroensis*, Engl. in Engl. Jahrb. x. 264; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349.

Lower Guinea. Hereroland: Usakos, 2700 ft., *Marloth*, 1246! Great Namaqualand; Rehoboth, *Pfeil*, 130, 173!

No specimen at Kew.

20. **M. cleomoides**, *C. B. Clarke*. Woody, viscous glandular hairy. Leaves $\frac{3}{4}$ by $\frac{1}{3}$ in., spathulate-elliptic, obtuse; petiole 0 – $\frac{1}{4}$ in. long. Flowers solitary; pedicels axillary, $\frac{1}{20}$ – $\frac{1}{5}$ in. long. Sepals 5, $\frac{1}{3}$ in. long, and upwards, linear. Corolla exceeding $\frac{3}{4}$ in. long. Lower anther-cell (rather strongly) tailed; pollen ellipsoid, with 2 stopples, and one row of small tubercles on either side of each stopple. Ovary pubescent at the top; style-base hairy. Capsule $\frac{1}{2}$ in. long, 2-seeded, hairy, stalked.—*Justicia cleomoides*, S. Moore in Journ. Bot. 1880, 313, t. 214, fig. 2.

Lower Guinea. Angola: Mossamedes, *Hoepfner*! *Welwitsch*, 5006!

Imperfectly known species.

21. **M. (?) ukambense**, *C. B. Clarke*. Branches stout, hairy. Leaves 2 by $\frac{3}{4}$ in., ovate, pubescent; petiole $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Flowers in the axils, and running into a terminal spike (1 in. long); bracts (floral leaves) with petioles $\frac{1}{3}$ in. long (or rather more), erect, obovate; bracts of terminal spike imbricate, $\frac{2}{3}$ in. long, elliptic; bracteoles very small. Calyx $\frac{1}{8}$ in. long. Corolla $\frac{1}{2}$ in. long. One anther-cell tailed.—*Justicia ukambensis*, Lindau in Engl. Jahrb. xx. 69, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 373.

Nile Land. British East Africa: Ukamba, *Hildebrandt*, 2725!

The example is young. I suspect a plant collected by Wakefield in a journey from Ribe to the Galla country to be this species; but in the absence of fruit it is doubtful.

45. **ADHATODA**, Nees; Benth. et Hook. f. Gen. Pl. ii. 1112.

Calyx subequally 5-fid to the base; lobes clearly imbricate. Corolla large, 2-lipped; tube nearly as long as the lips, inflated in the upper half; anticus lip ovate, 3-lobed; posticus nearly entire. Stamens 2, glabrous; anther-cells oblong, parallel, at nearly equal height, rounded, acute or shortly tailed at the base; pollen ellipsoid, the longitudinal smooth depressions with rows of patches, hardly of tubercles. Ovary shaggy; ovules 2 in each cell; style very shortly and equally bilobed. Capsule oblong-clavate, on a short solid stalk, 4-2-seeded; seeds rugose, sometimes obscurely so, not shining; placentæ not rising elastically.—Shrubs. Leaves large, elliptic, entire, much attenuate at either end. Spikes terminal, peduncled, forming a thyrsus or solitary; bracts ovate or linear-oblong; bracteoles 2, about as long as the calyx.

Species 8, in the tropical parts of Asia, Africa and America.

Adhatoda was described as a genus by Nees in Wall. Pl. As. Rar. iii. (1832) 102; and the name thus has priority over *Duvernoia*, Drège, first described by Nees in DC. Prod. xi. (1847) 322. But, if the bare printing of the name *Duvernoia* by Drège in 1837 be maintained to constitute priority of publication, it is not advisable to adopt the generic name *Duvernoia* for the subjoined species of *Adhatoda*, because *Duvernoia*, by reason of its campanulate calyx with subvalvate triangular lobes, would be by some (who sink *Adhatoda* in *Justicia*) kept up as a monotypic genus.

Adhatoda, though not well separable from *Justicia* by any one character, is here understood (as by Bentham) to comprise certain shrubs 4-12 ft. high, with large leaves and shaggy ovaries, in which the lower of the 2 anther-cells is not remote nor very long-tailed (as it is in *Justicia*).

Bracts ovate or orbicular, $\frac{1}{2}$ – $\frac{2}{3}$ in. broad; spikes dense, strobilate.

Bracts with scarious edges 1. *A. schimperiana*.

Bracts acute, with green edges 2. *A. engleriana*.

Bracts round, with green edges 3. *A. orbicularis*.

Bracts oblong-linear; spikes interrupted, not strobilate.

One anther-cell lower than the other, base shortly tailed 4. *A. tristis*.

Anther-cells at nearly equal height, base rounded.

Mature leaves pubescent on the nerves beneath 5. *A. robusta*.

Mature leaves nearly glabrous 6. *A. maculata*.

1. ***A. schimperiana***, Hochst. ex Nees in DC. Prod. xi. 388. Shrub. Leaves 6 by $2\frac{1}{4}$ in., narrowed at either end, obtuse, glabrous; petiole $\frac{1}{4}$ – $\frac{3}{4}$ in. long. Spikes 3-7 by 1 in., several peduncled, often forming a terminal thyrsus, strobilate; bract $\frac{2}{3}$ by $\frac{1}{2}$ in., minutely pubescent, with a prominent scarious margin; bracteoles $\frac{1}{3}$ – $\frac{1}{2}$ in. long, ovate. Sepals 5, nearly separate, subsimilar, $\frac{1}{3}$ in. long, oblong-lanceolate, pubescent. Corolla 1 in. in total length, yellowish, purple-spotted, lips $\frac{2}{3}$ in. long. One anther-cell slightly below the other, mucronate at the base; pollen ellipsoid, with two stopples, and rows of spots on the longitudinal smooth bands. Ovary and style-base shaggy. Capsule $\frac{3}{4}$ –1 in. long, pubescent, usually 4-seeded, lower $\frac{1}{3}$ part a cylindric stalk; placentæ not rising elastically: seeds glabrous, rugose.—A. Rich. Tent.

Fl. Abyss. ii. 155; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 242. *Justicia schimperiana*, T. Anders. in Journ. Linn. Soc. vii. 38; Engl. Hochgebirgsfl. Trop. Afr. 392; Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 345; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 348, fig. 139, E-J, and in Engl. Pfl. Ost-Afr. C. 373. *Gendarussa schimperiana*, Hochst. in Flora, 1841, i. Intell. 24, name only.

Nile Land. Eritrea: near Acrur, 6000 ft. *Schweinfurth & Riva* 741! 1067! Habab, 6000 ft., *Hildebrandt*, 457! Abyssinia: Tigré, 5000 ft., *Schimper*, 702! mountains near Axum, *Schimper*, 1549! near Adowa, *Schimper*, 27! Dembea; Gondar, *Steudner*, 1502! and without precise locality, *Salt! Schimper*, 888! 930! *Quartin Dillon & Petit*, 292! British East Africa: Duruma, *Hildebrandt*, 2341! Taita; Maungu Mountain, 2000 ft., *Johnston!*

Mozamb. Dist. German East Africa: *Fischer*, 164!

From Lindau's figure it might be supposed that the ovary is glabrous; it is very hairy.

2. **A. engleriana**, *C. B. Clarke*. Shrub. Leaves up to 14 by $5\frac{1}{2}$ in., tapering at both ends, with 12-16 pair of nerves, glabrate or pubescent on the midrib beneath; petiole up to $\frac{3}{4}$ in. long, or (even in the middle stem leaves) petiole winged to the base, auriculate. Spikes up to 7 by 2 in., dense, strobilate; bracts somewhat 4-ranked, up to 1 by $\frac{2}{3}$ in., ovate, triangular-tipped, thinly hairy, green, with 5-9 dark veins. Sepals 5, $\frac{1}{4}$ in. long, or rather more, oblong, acute, pubescent. Corolla $\frac{3}{4}$ -1 in. long; lips $\frac{2}{3}$ in. long. Filaments glabrous; anther-cells 2 at nearly equal height, the lower very shortly tailed; pollen ellipsoid, banded with 2 stopples, a row of spots (or almost depressed tubercles) on each side of each stopple. Ovary shaggy, hairs many, gland-tipped; style sparsely hairy at the base. Capsule 1 in. long, hairy, 4-seeded; base for $\frac{1}{3}$ in. solid, hardly narrowed; seeds $\frac{1}{5}$ in. in diam., circular, thin, brown, shallowly rugose-foveolate, opaque.—*Justicia engleriana*, Lindau in Engl. Jahrb. xx. 62, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 349, and in Engl. Pfl. Ost-Afr. C. 374.

Mozamb. Dist. German East Africa: Usambara; Masheua, *Holst*, 3491! Magila, *Kirk!* Kilimanjaro, *Volkens*, 506!

3. **A. orbicularis**, *C. B. Clarke*. Shrub, 12 ft. high; innovations, densely tawny-hairy. Leaves up to 11 by $4\frac{1}{2}$ in., elliptic, acute, when mature pubescent on the nerves, base triangular; petiole $\frac{1}{2}$ - $1\frac{3}{4}$ in. long. Spikes up to 10 by $\frac{3}{4}$ in., strobilate; bracts $\frac{1}{2}$ in. broad, $\frac{1}{3}$ - $\frac{1}{2}$ in. long, round, green, plicate, pubescent; bracteoles $\frac{1}{3}$ in. long, oblong-linear. Sepals 5, subequal, $\frac{1}{3}$ in. long, oblong-linear. Corolla $\frac{1}{2}$ in. long. Filaments hairy; one anther-cell slightly below the other, mucronate, hardly tailed; pollen ellipsoid, longitudinally banded, with single rows of spots on each side of each stopple. Ovary very hairy; style-base hairy; branches 2, equal, narrow-oblong.—*Duvernoia orbicularis*, Lindau in Engl. Jahrb. xxii. 123, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 339.

Upper Guinea. Cameroons: Yaunde, *Zenker & Staudt*, 41! Fernando Po, *Mann*, 1435!

4. **A. tristis**, Nees in *DC. Prod.* xi. 404. Herbaceous up to 4 ft. high; innovations densely fulvous-hairy. Leaves 9 by $4\frac{1}{2}$ in., shortly acuminate, when mature pubescent on the nerves beneath, base triangular; petiole $1-2\frac{1}{2}$ in. long. Spikes in the upper axils 6 by $\frac{1}{2}$ in., interrupted at the base, not strobilate; bracts scarcely $\frac{1}{3}$ in. long, lanceolate; bracteoles similar, smaller. Sepals 5, $\frac{1}{3}$ in. long or more, linear. Corolla $\frac{3}{4}$ in. long, purple. Filaments very hairy; one anther-cell much lower than the other; base acute, hardly mucronate; pollen ellipsoid, longitudinally banded, with single rows of spots on each side of each stopple. Ovary shaggy; style hairy. Capsule more than 1 in. long, stalk $\frac{1}{2}$ in. long; seeds 4.—Benth. in *Hook. Niger Fl.* 484. *Justicia tristis*, T. Anders. in *Journ. Linn. Soc.* vii. 38.

Upper Guinea. Cameroons: Bipinde, *Zenker*, 1043! Fernando Po, *Vogel*, 161! *Mann*, 165!

5. **A. robusta**, *C. B. Clarke*. Shrub 10–15 ft. high, young parts densely rusty-tomentose. Leaves 10 by $4\frac{1}{4}$ in.; nerves 17 pairs; petiole $1\frac{1}{2}$ in. long. Thyrsus 9 by 4 in., nearly without floral leaves; flower-spikes 3 by $\frac{3}{4}$ in.; bracts in the lower part of a spike distant, $\frac{1}{4}-\frac{1}{3}$ in. long, obovate, shortly acuminate; bracteoles nearly as the sepals. Sepals $\frac{1}{4}-\frac{1}{3}$ by $\frac{1}{12}$ in., oblong, acute, pubescent. Corolla $\frac{2}{3}-\frac{3}{4}$ in. long, white. Filaments glabrous; anther-cells at nearly equal height rounded at the base; pollen ellipsoid, with 2 longitudinal smooth bands without tubercles. Ovary very hairy. Capsule not seen.—*Justicia robusta*, T. Anders. MS.

Upper Guinea. Fernando Po, 3000 ft., *Mann*, 634!

This fine plant is closely allied in habit and characters to *A. Vasica*, Nees, but differs in the loose, not strobilate, spikes and the smaller bracts and flowers.

6. **A. maculata**, *C. B. Clarke*. Climber, 10–15 ft. high, innovations densely and minutely fulvous-hairy. Leaves up to 7 by $3\frac{1}{4}$ in., acute, when mature glabrate, base rounded or triangular; petiole $1-2$ in. long. Spikes terminal, $3-4$ by $\frac{2}{3}$ in., interrupted, not strobilate; bracts $\frac{1}{6}$ in. long, lanceolate, puberulous. Sepals 5, subequal, $\frac{1}{4}$ in. long, and upwards, linear-lanceolate. Corolla 1 in. long, white, purple-spotted. Filaments glabrous; 2 anther-cells at nearly equal height, rounded at the base; pollen ellipsoid, with 2 stopples, the longitudinal smooth bands having a granular (scarcely spotted) band on each side the stopple. Ovary shaggy.—*Justicia maculata*, T. Anders. in *Journ. Linn. Soc.* vii. 38. *Duvernoia Buchholzii*, Lindau in *Engl. Jahrb.* xx. 43, and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 339.

Upper Guinea. Fernando Po, *Mann*, 202! Cameroons: Quaqua River, *Buchholz*!

Imperfectly known species.

7. **Duvernoia haplostachya**, Lindau in *Engl. Jahrb.* xxiv. 324. Branches hairy. Leaves 4 by 2 in., ovate, narrowed at either end, hairy on the nerves beneath; petiole $\frac{1}{3}$ in. long. Spike terminal, simple, shorter than the leaves; rhachis pubescent; flowers opposite;

bracts and bracteoles small. Calyx $\frac{1}{10}$ in. long. Corolla-tube $\frac{1}{10}$ in. long; lobes $\frac{1}{6}$ in. long. Anther-cells at unequal height; lower long-spurred. Ovary and style hairy. Capsule unknown.

South Central. Congo Free State; Towa Mountains, *Descamps*.

This description reads like that of a *Monechma*; but without any knowledge of the pistil it is vain to guess.

46. **RHINACANTHUS**, Nees; Benth. et Hook. f. Gen. Pl. ii. 1112.

Sepals 5, nearly distinct, subequal, small, linear, hairy. Corolla 2-lipped; tube linear, longer than the lips; anticous lip of 3 elliptic lobes; posticous linear-oblong or ovate-oblong, subentire. Stamens 2, shortly exerted; anthers 2, one somewhat below the other, at the base acute, not tailed, or in *R. subcaudatus* shortly tailed; pollen ellipsoid, stopples 3 on the three smooth bands which do not quite reach the poles. Ovary hairy; ovules 2 in each cell; stigma of 2 small lanceolate subequal lobes. Capsule stalked, oblong, 4-seeded; placentæ not rising elastically from the base of the valves; seeds covered with tubercles.—Rambling. Leaves entire, margins often obscurely undulate-crenate. Flowers in sessile distant clusters on the branches of the panicle; bracts and bracteoles very small, linear.

Species 3 or 4, in Africa and India.

Leaves in the opposite pairs equal in length.

Lower leaves narrowed at the base, ovate-lanceolate. 1. *R. communis*.

Lower leaves rounded or subcordate at the base . 2. *R. rotundifolius*.

Leaves in the opposite pairs unequal in length . . 3. *R. subcaudatus*.

1. ***R. communis***, Nees in Wall. Pl. As. Rar. iii. 109. Sparingly pubescent. Leaves 2–5 in. long, ovate to lanceolate, scarcely acute, nearly glabrous, base narrowed except in the upper floral leaves (which are sometimes sessile and sub-cordate); petiole $0\text{--}\frac{1}{4}$ in. long. Panicle (in most of the East African examples as in India) 6–12 in. long, with few floral leaves, much-branched and with very many clusters of flowers; in most West African examples the panicle has many floral leaves, 1–3 in. long, and the flower-clusters are few. Bracts $\frac{1}{8}\text{--}\frac{1}{4}$ in. long, linear. Calyx $\frac{1}{8}\text{--}\frac{1}{4}$ in. long. Corolla-tube $\frac{3}{4}$ in. long, linear to the top; lips $\frac{1}{3}$ in. long, posticous linear-oblong. Capsule $\frac{2}{3}$ in. long, thinly hairy; seeds finally black.—Nees in DC. Prod. xi. 442; Wight, Ic. t. 464; T. Anders. in Journ. Linn. Soc. vii. 51; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 541; S. Moore in Journ. Bot. 1880, 342; Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 346; Lindau in Engl. Jahrb. xviii. 63, t. 2 fig. 68. *R. gracilis*, Klotzsch in Peters, Reise Mossamb. Bot. 218; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 339, and in Engl. Pfl. Ost-Afr. C. 371. *R. nasutus*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 339, and in Engl. Pfl. Ost-Afr. C. 371. *Justicia nasuta*, Linn. Sp. Plant. 16; Bot. Mag. t. 325. *J. scandens*, Vahl, Symb. ii. 7. *Leptostachya virens*, Nees in DC. Prod. xi. 378; Benth. in Hook. Niger Fl. 482. *Pseuderanthemum dichotomum*, Lindau in Engl. Jahrb. xx. 40, and in

Engl. & Prantl, Pflanzenfam. iv. 3 B. 330, and in Engl. Pfl. Ost-Afr. C. 371.

Upper Guinea. Sierra Leone: Scarcies River, *Scott-Elliot*, 4428! and without precise locality, *Afzelius*! Cameroons: Batanga, *Bates*, 189! Bipinde, 1000 ft., *Zenker*, 1260! Victoria, *Preuss*, 1219! 1384!

Nile Land. British East Africa: 40–60 miles from the Mombasa coast, *Johnston*! Nyika country near Mombasa, *Wakefield*! Wanga, *Smith*! Ukamba, *Hildebrandt*, 2628! Duruma, *Hildebrandt*, 2346!

Lower Guinea. Gaboon: on the coast, *Middleton*! Gaboon River, *Mann*, 1015! Como River, *Bates*, 458! Munda; Sibange Farm, *Büttner*, 358! *Soyaux*, 198B! Angola, *Welwitsch*, 5010! 5191! 5204!

Mozamb. Dist. German East Africa: Usagara; Mpwapwa, *Stuhlmann*, 249! Usambara; Duga, *Holst*, 3289! Masheua, *Holst*, 8782! and Nyika Steppe, *Holst*, 3902A! Portuguese East Africa: base of Morambala Mountain, *Kirk*! Sena, *Carvalho*! British Central Africa: Nyasaland, *Buchanan*, 863! Shire Highlands, *Buchanan*, 72! by the River Ruo, south of Blantyre, *Scott-Elliot*, 8598! Mount Mlanje, *Scott-Elliot*, 8655! near Blantyre, *Last*! Zomba, 3000 ft., *Whyte*! and without precise locality, *Buchanan*, 863! Matabeleland; banks of the River Matengwe, *Holub*, 1285! 1286!

I am unable to divide this widespread species into two. The leafy-panicled form has rather smaller flowers, and T. Anderson at first tried to make it a separate species. The form with a large panicle destitute of floral leaves (*Pseuderanthemum dichotomum*, Lindau = *Rhinacanthus gracilis*, Klotzsch) is the common form in India, the original *Justicia Nasuta* of Linnæus.

2. **R. subcaudatus**, *C. B. Clarke*. Leaves of each pair unequal; one often only $\frac{2}{3}$ – $\frac{1}{2}$ the length of the other, round-ovate. Corolla-tube about $\frac{1}{2}$ in. long, slender; posticous lip ovate-oblong. Lower anther-cell with a short white tail. Capsule $\frac{1}{2}$ in. long, and seeds as of *R. communis* but smaller.

Upper Guinea. Sierra Leone: near the Scarcies River, at Wallia, *Scott-Elliot*, 4276! and near Sasseni, *Scott-Elliot*, 4428! and without precise locality, *Afzelius*!

“Kondoï (native name), a medicine for indigestion” (*Scott-Elliot*).

3. **R. rotundifolius**, *C. B. Clarke*. Branches 6-angular, pubescent. Lower leaves 2 by $1\frac{1}{2}$ in., glabrate, base rounded or subcordate, nerves prominent, finely reticulated on the under surface; cystoliths many on both surfaces; petiole $\frac{1}{8}$ in. long. Panicle compound, with many floral leaves (*i.e.*, cymes mainly axillary); flower clusters loose, or cymes $\frac{1}{2}$ – $\frac{3}{4}$ in. long, dense. Corolla yellowish-white (*Thomas*); tube $1\frac{1}{4}$ in. long. Capsule $\frac{2}{3}$ – $\frac{3}{4}$ in. long, pubescent, 4-seeded; seeds tuberculate, black.

Nile Land. British East Africa: Tana River, *Thomas*, 7! 89!

Closely allied to *R. communis*, Nees, but differs from all forms of that species by the very broad rounded base to the leaves.

Imperfectly known species.

4. **R. ndorensis**, *Schweinf. in Höhnel, Zum Rudolph-See u. Stephanie-See, Sonderabdr.* 7. Small shrub, with the general aspect of

Justicia uncinulata, Oliv. Leaves obovate. Corolla tube twice as long as the calyx, pubescent; lobes ciliate. Style with scattered hairs.—Engl. Hochgebirgsfl. Trop. Afr. 394; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 339, and in Engl. Pf. Ost-Afr. C. 371.

Nile Land. British East Africa: Ngoro, at the foot of Mount Kenia, 6500 ft., *Höhnel*.

The above diagnosis is the whole given by Schweinfurth, nor does Engler or Lindau add aught.

47. **ANISOTES**, Nees; Benth. et Hook. f. Gen. Pl. ii. 1111.

Sepals 5, nearly free, subequal, linear-triangular, 3-nerved. Corolla 2-lipped, red; tube short; lips very long, entire or minutely lobed, narrow-oblong. Stamens 2; filaments long, glabrous; anther-cells 2, linear-oblong, minutely white-tipped (not tailed) at the base, one a little below the other; pollen ellipsoid, 2-banded, with one or two rows of marks or tubercles on each side of the stopples. Pistil glabrous; ovules 2 in each cell; stigma subentire. Capsule (only known in *A. diversifolius*) oblong, 4-seeded, stalk cylindric, placentæ not rising elastically from the base of valves; seeds scabrous, almost tubercular on the margins.—Shrubs. Leaves entire. Flowers sessile, axillary clustered, or in dense spikes; bracts very small, shorter than the calyx.

Species 5, in Africa and Arabia.

The corolla is exceedingly like that of *Macrorungia*, as are the stamens, pollen and pistil. Further, the capsule being unknown in 4 out of 5 species, the placing these species in *Anisotes* would appear provisional merely. But the peculiar, 3-nerved, elongate-triangular sepals, much longer than the bracts, leave little doubt that the 5 species are congeneric.

Flowers 1–3 together in axillary clusters.

Leaves up to 7 in. long 1. *A. sessiliflorus*.

Leaves $\frac{3}{4}$ –1 in. long 2. *A. parvifolius*.

Flowers in short shortly-peduncled axillary spikes.

Flowers very many. Leaves large, up to 14 in. long 3. *A. Zenkeri*.

Flowers few. Leaves $\frac{3}{4}$ in. long 4. *A. velutinus*.

1. ***A. sessiliflorus***, *C. B. Clarke*. Glabrate; innovations densely grey-tomentose with minute simple hairs. Leaves up to 7 by $2\frac{1}{4}$ in., closely and minutely dotted on both surfaces, minutely scabrous-hispid on the nerves, finally glabrous, sessile. Flowers solitary or 2–3 together, axillary, sessile. Calyx $\frac{1}{5}$ – $\frac{1}{4}$ in. long, minutely and densely grey-tomentose. Corolla-tube $\frac{1}{3}$ in. long; anticous lip $1\frac{1}{4}$ – $1\frac{3}{4}$ in. long.—*Himantochilus sessiliflorus*, Benth. in Benth. et Hook. f. Gen. Pl. ii. 1117; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 346, fig. 110, P, and in Ann. Istit. Bot. Roma, vi. (1896) 82. *H. sessilifolius*, Lindau in Engl. Pf. Ost-Afr. C. 372.

Nile Land. Somaliland, *Robecchi*, 546, 652, 653! British East Africa: Ribe to Galla country, *Wakefield*! Taita, *Hildebrandt*, 2375!

Mozamb. Dist. British Central Africa: Nyasaland; Shibisa (Chikwawa), on the River Shire, *Meller*!

2. **A. parvifolius**, Oliv. in Hook. Ic. Pl. t. 1527. Leaves $\frac{3}{4}$ –1 by $\frac{1}{3}$ – $\frac{1}{2}$ in., obovate; otherwise as *A. sessiliflorus*.—Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 346; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 351, and in Engl. Pfl. Ost-Afr. C. 374.

Nile Land. British East Africa: Kilimanjaro expedition, 40–60 miles from the Mombasa coast, Johnston!

In *A. sessiliflorus* there occur small leaves 1–1 $\frac{1}{2}$ in. long on some shoots and in some axils. The material for *A. parvifolius* is scanty, and I suspect that with more it and *A. sessiliflorus* may hereafter be judged to be one. *A. trisulcus*, Nees, the type of the genus, differs little but by the persistent grey pubescence.

3. **A. Zenkeri**, C. B. Clarke. Glabrate; innovations minutely hairy. Leaves up to 14 by 5 $\frac{1}{2}$ in., narrowed at both ends; petiole 1 $\frac{1}{2}$ in. long. Spikes axillary, 2 in. long, dense with very numerous flowers; bracts small. Calyx $\frac{1}{8}$ – $\frac{1}{5}$ in. long, glabrous or sparsely bristly. Corolla 1 $\frac{1}{4}$ in. long. Stamens, pollen and pistil of the genus.—*Himantochilus Zenkeri*, Lindau in Engl. Jahrb. xx. 60, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 346, fig. 141, B.

Upper Guinea. Cameroons: Yaunde, Zenker, 119! 194, 647! 675!

4. **A. velutinus**, Lindau in Engl. Jahrb. xx. 76. Shrub, 2 ft. high, grey with dense minute white hairs; branches very woody. Leaves $\frac{2}{3}$ by nearly $\frac{1}{2}$ in., round-obovate, very obtuse; petiole $\frac{1}{8}$ in. long. Axillary peduncles $\frac{1}{8}$ – $\frac{1}{2}$ in. long, carrying 3–1 flowers close together at the top; bracts (or bracteoles) $\frac{1}{8}$ in. long, linear. Sepals 5, $\frac{1}{3}$ in. long, linear-lanceolate, 3-nerved. Corolla $\frac{2}{3}$ in. long; lips long; anticous narrow, hairy without. One anther-cell below the other, mucronate at the base or very short-tailed. Ovary hairy towards the top.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 351.

Nile Land. Somaliland: Ahl Mountains, 6500 ft., Hildebrandt, 855B!

Corolla hardly half the length of that of *A. parvifolius*.

48. **ISOGLOSSA**, Oerst.; Benth. et Hook. f. Gen. Pl. ii. 1111.

Calyx small, subequally 5-partite nearly to the base; segments lanceolate or linear. Corolla small or medium-sized (or 1–1 $\frac{1}{4}$ in. long in sect. *Pseud-Adhatoda*), 2-lipped; tube thick-cylindric or inflated in the upper half (not linear); anticous lip ovate, deeply 3-lobed or sub-entire, white, red or yellow with the palate often spotted; posticous lip ovate to oblong, 2-lobed or nearly entire. Stamens 2 (without rudiments of the other two); filaments glabrous; one anther-cell completely over the other, elliptic, or (in sect. *Pseud-Adhatoda*) anther-cells oblong parallel, one very slightly below the other; base of anther-cells rounded or minutely mucronate, not tailed; pollen globose compressed, the 2 flattened faces circular, nearly smooth, with a stopple in the centre. Pistil glabrous; style very shortly and equally 2-lobed; disc a thickened ring (not a cup); ovary with 2 ovules in each cell. Capsule rather

small, ellipsoid, compressed, 4-seeded; stalk short (or not longer than the ellipsoid part), cylindric, solid; placentæ not rising elastically from the base of the valves; seeds small, tubercular-scabrous, tubercles often elongate.—Herbs, with slender branches, sometimes 6 ft. high. Leaves ovate or elliptic, acuminate at either end, entire, petioled; upper leaves often sessile, cordate. Inflorescence paniced, terminal and with axillary branches, pubescent, often glandular; floral leaves and bracts usually narrow or small (but larger and enclosing the calyx in *I. substrobilina* and *I. Gregorii*).

Species 25, in Africa and the Mascarene Islands, besides a few in India.

By some inadvertence, Lindau, in Engl. & Prantl, Pflanzenfam. iv. 3 B. 342, separates *Isoglossa* from all other *Justicieæ* by the character of 4 stamens; it never has more than 2.

*EU-ISOGLOSSA.—Anther-cells elliptic, one above the other.

Most of the flowers pedicelled.

Species of West Africa.

- Leaves very thin, nearly glabrate 1. *I. glandulifera*.
Nerves of leaves strong, beneath scabrous 2. *I. nervosa*.

Species of East Africa.

Mature leaves glabrous or very nearly so.

Corolla $\frac{1}{2}$ – $\frac{2}{3}$ in. long.

Panicle hairy.

- Leaves up to 3 in. long 3. *I. laxa*.
Leaves up to 7 in. long 4. *I. membranacea*.
Panicle glabrate 5. *I. lactea*.
Corolla nearly 1 in. long 6. *I. Volkensii*.

Mature leaves pubescent, at least on the nerves.

Bracts narrow.

Panicle terminal.

- Leaves $\frac{3}{4}$ in. long; corolla $\frac{1}{8}$ in. long 7. *I. parvifolia*.
Leaves 4 in. long; corolla $\frac{2}{3}$ in. long 8. *I. somalensis*
Panicles numerous, terminal and axillary 9. *I. strigosula*.
Bracts ovate (small) 10. *I. mossambicensis*.

Flowers in small heads on the branches of a panicle.

Leaves to the flower-clusters (or bracts) narrow, not enclosing the calyx.

- Sepals $\frac{1}{2}$ – $\frac{1}{8}$ in. long, subpetaloid, hairy 11. *I. runssorica*.
Sepals $\frac{1}{5}$ in. long, linear, green 12. *I. oerstediana*.
Sepals $\frac{3}{4}$ in. long, subulate in the upper half 13. *I. milanjiensis*.

Leaves to flower-clusters (or bracts) enclosing the calyx.

- Floral leaves distant, ovate, subacute 14. *I. Gregorii*.
Floral leaves imbricate, suborbicular 15. *I. substrobilina*.

**PSEUD-ADHATODA.—Anther-cells oblong, parallel, at nearly equal height.

Corolla-lips as long as the tube.

- Panicle-branches few; corolla 1 in. long 16. *I. grandiflora*.
Panicle-branches very many; corolla $\frac{2}{3}$ in. long 17. *I. floribunda*.

Corolla-lips much shorter than the tube.

- Hairs on panicle, and sepal tipped with red glands 18. *I. rubescens*.
Hairs on sepals long, white, without red glands 19. *I. ixodes*.

1. **I. glandulifera**, Lindau in *Engl. Jahrb.* xx. 54. Herb, 4–10 ft. high. Leaves 3 by $1\frac{1}{2}$ in. (or sometimes up to 8 by 3 in.); elliptic, acuminate, very sparsely hairy, base very narrowly truncate, subauricled; petiole up to 1–2 in. long; upper leaves smaller, often sessile, subcordate. Panicle often 6 by 3 in., terminal, very loose, sparsely glandular hairy; bracts $\frac{1}{8}$ in. long, linear. Calyx $\frac{1}{2}$ in. long, subequally 5-fid nearly to the base; segments linear-lanceolate, with few scattered glandular many-celled white hairs, otherwise glabrous. Corolla $\frac{3}{4}$ –1 in. long, light red, nearly glabrous; tube cylindric-funnel-shaped, much longer than the lips. Anther-cells muticous, widely separated one over the other; pollen globose, compressed, smooth. Capsule $\frac{2}{3}$ in. long (whereof $\frac{1}{3}$ in. is a cylindric stalk), narrow, 4-seeded; seeds small, scabrous with long tubercles.—Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 344.

Upper Guinea. Cameroons: Buea, 5000 ft., *Preuss*, 746! near Mimbia, 3900 ft., *Preuss*, 1062! Cameroon Mountain, 7000 ft., *Mann*, 1972! *Johnston*, 62! *Kalbreyer*, 134! Fernando Po, 4000 ft., *Mann*, 579!

2. **I. nervosa**, C. B. Clarke. Herb, 5 ft. high. Leaves up to $3\frac{1}{2}$ by 2 in., rhomboid-ovate; nerves beneath prominent, scabrous hairy; base acuminate; petiole $1\frac{1}{2}$ in. long; uppermost leaves smaller, nearly sessile, subcordate. Panicle up to 12 by 8 in., glandular hairy. Corolla $\frac{3}{4}$ in. long, white; tube longer than the lips; otherwise nearly as *I. glandulifera*.

Upper Guinea. Cameroon Mountain, 7000–8000 ft., *Mann*, 2009! *Johnston*, 63!

“Nearly allied to, if not identical with, *I. laxa*,” Oliv. in *Trans. Linn. Soc.* ser. 2, Bot. ii. 346.

3. **I. laxa**, Oliv. in *Trans. Linn. Soc.* ser. 2, Bot. ii. 345. Branches glabrate, with many longitudinal cystoliths. Leaves 3 by $1\frac{1}{4}$ in., narrowed at both ends, glabrate; petiole $\frac{1}{3}$ in. long. Panicle 7 by 3 in., terminal, lax, hairy; floral leaves up to $\frac{1}{2}$ by $\frac{1}{2}$ in., mostly small, linear; pedicels $\frac{1}{20}$ – $\frac{1}{10}$ in. long; bracteoles 0 or most minute. Calyx $\frac{1}{4}$ in. long, divided subequally nearly to the base; segments linear, obtuse, pubescent, and with long several-celled scarious hairs. Corolla $\frac{1}{2}$ – $\frac{2}{3}$ in. long; tube about as long as the lips, sparingly hairy without, pink. Filaments glabrous; anther-cells oblong, tail-less, one entirely below the other; pollen lenticular, with one stopple in the centre of each face. Capsule $\frac{1}{2}$ in. long, stalked, perfecting 4 seeds (not seen ripe).—*Engl. Hochgebirgsfl. Trop. Afr.* 394; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 344, and in *Engl. Pfl. Ost-Afr. C.* 372.

Mozamb. Dist. German East Africa: Kilimanjaro, 7000 ft., *Johnston*, 11!

On the lower portion of the stems it is probable, from the analogy of allied species, that long petioles occur; but Oliver’s statement, “petioles $\frac{1}{2}$ –2 in. long,” was taken from a fragment.

Var. *pilosa*, Schweinf. in Höhnel, Zum Rudolph-See u. Stephanie-See, Sonderabdr. 7; *Engl. Hochgebirgsfl. Trop. Afr.* 394; Lindau in *Engl. Pfl. Ost-Afr. C.* 372.

Nile Land. British East Africa: Leikipia, 6500 ft., *Höhnel*.

There is not one word of description given to this variety by Schweinfurth.

4. ***I. membranacea***, *C. B. Clarke*. Leaves 7 by $2\frac{1}{4}$ in., much tapering at either end, membranous; petiole $1-2\frac{1}{2}$ in. long. Calyx $\frac{1}{8}$ in. long; otherwise as *I. laxa*.

Mozamb. Dist. British Central Africa: Nyasaland; Masuka Plateau, 6500-7000 ft., *Whyte!*

The calyx is about half the length of *I. laxa*, the corolla is somewhat smaller. The large very thin leaves may be due principally to a shady moist habitat.

5. ***I. lactea***, *Lindau in Engl. Jahrb.* xx. 55. Leaves up to 4 by $1\frac{3}{4}$ in., ovate, narrowed at either end, nearly glabrous; petiole up to $1\frac{1}{2}$ in. long. Peduncles axillary and subterminal, slender, bearing a lax nearly glabrous panicle 1-3 in. long; bracts $\frac{1}{2}$ in. long, linear. Calyx $\frac{1}{8}-\frac{1}{6}$ in. long, divided nearly to the base; segments linear, subequal, minutely scabrous-hairy. Corolla exceeding $\frac{1}{2}$ in. long, cream-white (or violet in the form *I. violacea*), nearly glabrous; tube shorter than the lips. Filaments glabrous, or in Lindau's figure ciliate on one side; anther-cells muticous, one below the other; pollen lenticular, with one stopple on each face. Pistil glabrous. Capsule $\frac{1}{2}$ in. long, stalked, 4-seeded; seeds tubercular-scabrous.—Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 344, fig. 107, B, and in *Engl. Pfl. Ost-Afr.* C. 372. *I. flava*, Lindau in *Engl. Jahrb.* xxii. 125. *I. violacea*, Lindau in *Engl. Jahrb.* xxii. 125.

Nile Land. British East Africa: Toru; Kivata, 8000 ft., *Scott-Elliot*, 7664!

Mozamb. Dist. German East Africa: Usambara: Nguelo, *Holst*, 2279! Lutindi, *Holst*, 3252! Uluguru, 3300-5500 ft., *Stuhlmann*, 9032! 8822!

Lindau says the corolla-tube in *I. violacea* is only $\frac{1}{10}$ in. long; it appears to me scarcely shorter than in *I. lactea*. *Scott-Elliot's* 7664 has a few scattered hairs on the upper surface of the leaves.

6. ***I. Volkensii***, *Lindau in Engl. Jahrb.* xx. 55. Leaves 4 by $1\frac{1}{2}$ in., elliptic, acuminate at either end, glabrous. Flowers laxly paniced, clear rose colour; bracts very small. Calyx $\frac{1}{6}$ in. long, finely hairy. Corolla-tube more than $\frac{1}{2}$ in. long; lips $\frac{2}{5}$ in. long, rather broad. Capsule $\frac{1}{2}$ in. long, 4-seeded; otherwise as *I. lactea*.—Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 344, and in *Engl. Pfl. Ost-Afr.* C. 372.

Mozamb. Dist. German East Africa: Kilimanjaro, 8000 ft., *Volkens*, 990!

7. ***I. parvifolia***, *Rendle in Journ. Bot.* 1896. 411. Branches 18 in. long, slender. Leaves $\frac{3}{4}$ by $\frac{1}{2}$ in., ovate, pubescent on the nerves beneath; petiole $\frac{1}{4}$ in. long. Panicle small, few-flowered, very lax. Sepals $\frac{1}{8}$ in. long, linear, scabrous. Corolla $\frac{1}{3}$ in. long. One anther-cell below the other, distant from the other, both muticous. Capsule $\frac{1}{3}$ by $\frac{1}{8}$ in., narrowly oblong, 4-seeded; seeds rough, glabrous.

Nile Land. Somaliland: Sheik Husein, *Donaldson Smith!*

8. **I. somalensis**, *Lindau in Ann. Istit. Bot. Roma*, vi. (1896) 82. Leaves up to $4\frac{1}{2}$ by $1\frac{3}{4}$ in., ovate, pubescent; petiole 1 in. long. Panicle terminal, 3 by $1\frac{1}{2}$ in., very minutely hairy; bracts scarcely $\frac{1}{12}$ in. long. Sepals nearly $\frac{1}{3}$ in. long, linear, puberulous. Corolla puberulous; tube $\frac{1}{3}$ in. long; lips $\frac{1}{3}$ in. long. One anther-cell far below the other.

Nile Land. Somaliland: between Algehe and Oi, *Riva*, 1293!

"Allied to *I. lactea*" (Lindau); and does not differ much, except that the leaves are minutely hairy on the upper surface.

9. **I. strigosula**, *C. B. Clarke*. Branches terete, with one or two hairy lines or glabrescent; cystoliths many, small, longitudinal. Leaves up to $1\frac{3}{4}$ by $\frac{3}{4}$ in., acuminate at either end, strigose-hairy on the nerves beneath; petiole $\frac{1}{3}$ in. long; many upper leaves smaller, subsessile. Panicles terminal and many axillary, loose, slender; pedicels $0-\frac{1}{8}$ in. long. Calyx $\frac{1}{8}-\frac{1}{6}$ in. long, subequally 5-partite nearly to the base; segments linear, minutely scabrous-hairy. Corolla $\frac{1}{2}$ in. long; very hairy without; tube about as long as the lips. Filaments glabrous; anther-cells muticous, one completely below the other; pollen lenticular, a stopple on each face.

Mozamb. Dist. British Central Africa: Nyasaland; Masuka Plateau, 6500-7000 ft., *Whyte*, 288!

Allied to *I. lactea*, but more pubescent.

10. **I. mossambicensis**, *Lindau in Engl. Pfl. Ost-Afr. C.* 372. Branches glandular-pubescent. Leaves up to 4 by 1 in., elliptic-lanceolate, with glandular many-celled hairs near the basal margin and continued down the petiole. Spikes axillary and terminal, 1 in. long, about 10-flowered; floral leaves $\frac{1}{6}-\frac{1}{5}$ in. long, ovate or obovate, acuminate. Sepals $\frac{1}{8}-\frac{1}{5}$ in. long, glandular-hairy. Corolla $\frac{3}{5}$ in. long, glabrous; tube hardly $\frac{1}{8}$ in. long. Anther-cells muticous, divaricate, one somewhat above the other.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 344, and in *Engl. Jahrb.* xxiv. 324.

Mozamb. Dist. Portuguese East Africa: Gorongoza, *Carvalho*:

This differs from its neighbours principally in the broad (though small) floral leaves.

11. **I. runssorica**, *Lindau in Engl. Jahrb.* xx. 56. Stem with many longitudinal cystoliths, hairy along two lines or glabrate. Leaves 6 by $2\frac{1}{4}$ in., acuminate at either end, nearly glabrous; petiole $0-1\frac{3}{4}$ in. long. Panicle branches 6 by $\frac{1}{3}$ in., pubescent; flowers in distant clusters; bracts less than $\frac{1}{8}$ in. long, linear, glabrous. Calyx $\frac{1}{12}-\frac{1}{8}$ in. long, divided nearly to the base, scarious, subpetaloid; segments linear-lanceolate, with minute hairs but no cystoliths. Corolla $\frac{1}{3}$ in. long. Anther-cells one above the other; pollen lenticular, with one stopple on

each face and no distinct girdle. Pistil glabrous.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344, and in Engl. Pfl. Ost-Afr. C. 372.

Nile Land. British East Africa: Ruwenzori; Toru district, in Wimi Valley, 7000–8000 ft., *Scott-Elliot*, 7836! and in Butagu Valley, 6000–8000 ft., *Scott-Elliot*, 7915! *Stuhlmann*, 2474!

12. ***I. oerstediana***, *Lindau in Engl. Jahrb.* xx. 56. Calyx-segments $\frac{1}{5}$ in. long, nearly free, linear, green, subulate and curved in the upper half, with cystoliths. Capsule $\frac{1}{2}$ in. long, 4-seeded; seeds with rough oblong tubercles; otherwise as *I. runssorica*.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344, and in Engl. Pfl. Ost-Afr. C. 372.

Nile Land. Abyssinia, *Schimper*! British East Africa: Raomi River, 7000 ft., *Scott-Elliot*, 6767!

Mozamb. Dist. German East Africa: Kilimanjaro, 4500–9000 ft., *Volkens*, 1121! 1123 1382! 1387! 1852! 1936! *Johnston*, 11A! Usambara, *Holst*, 523!

The difference of this plant from *I. runssorica* is small. Lindau lays stress on the pubescent panicle branches of *I. runssorica*, but the panicle branches of the present species are similarly pubescent.

13. ***I. milanjiensis***, *S. Moore in Trans. Linn. Soc. ser. 2, Bot.* iv. 33. Calyx-segments $\frac{1}{4}$ in. long, in fruit nearly $\frac{1}{3}$ in. long, nearly free, linear, green, minutely hairy, subulate and curved in the upper half. Corolla $\frac{1}{2}$ in. in total length; otherwise nearly as *I. oerstediana* and *I. runssorica*.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344, and in Engl. Pfl. Ost-Afr. C. 372.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, 6000 ft., *Whyte*!

14. ***I. Gregorii***, *Lindau in Engl. Pfl. Ost-Afr. C.* 372. Leaves $1\frac{3}{4}$ by 1 in., ovate, nearly glabrous. Inflorescence terminal up to 4 by $\frac{1}{2}$ in.; flowers in small sessile clusters; outer bract (of *S. Moore*) $\frac{1}{3}$ – $\frac{1}{2}$ in. long, ovate, enclosing 3–1 flowers; bract $\frac{1}{4}$ in. long, linear. Calyx $\frac{1}{3}$ in. long, and upwards, pubescent. Corolla-tube $\frac{1}{3}$ in. long; lips $\frac{1}{8}$ in. long. Anther-cells one much lower than the other. Pistil, capsule, and seeds of the genus.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344. *Homilacanthus Gregorii*, *S. Moore in Journ. Bot.* 1894, 129, t. 343.

Nile Land. British East Africa: Mount Kenia, 7000 ft., *Gregory*!

S. Moore regarded the floral-leaves (*tragblätter*) which enclose the flower-clusters as bracts (*deckblätter*); and therefore supposed this species must fall among Bentham's subtribe *Dicliptereæ*.

15. ***I. substrobilina***, *C. B. Clarke*. Branches quadrangular, with a strong line of deflexed white hairs. Leaves up to $3\frac{1}{2}$ by $1\frac{1}{4}$ in., acuminate at either end, when mature nearly glabrous except on the nerves; cystoliths many on both faces; petiole $\frac{1}{4}$ to $\frac{3}{4}$ in. long. Spikes

terminal (and also on short lateral branches), $\frac{1}{2}$ – $1\frac{1}{4}$ by $\frac{1}{3}$ – $\frac{1}{2}$ in., dense, almost strobilate, softly white hairy; bracts $\frac{1}{4}$ in. long and broad, nearly orbicular. Sepals $\frac{1}{5}$ in. long, linear. Corolla-tube $\frac{1}{10}$ – $\frac{1}{8}$ in. long; anticous lip $\frac{1}{3}$ in. long, broad-elliptic, subentire; posticous lip $\frac{1}{3}$ in. long, oblong, subentire. Anther-cells muticous, one completely over the other; pollen globose compressed, with one stopple on each smooth face. Pistil of the genus.

Nile Land. British East Africa: Mau, 7000–8000 ft., *Scott-Elliot*, 6769!

16. **I. grandiflora**, *C. B. Clarke*. Stem pubescent, glandular upwards. Leaves up to 5 by $2\frac{3}{4}$ in., acuminate at either end, when mature minutely pubescent on the nerves beneath; cystoliths numerous, small; petiole 0 – $\frac{1}{2}$ in. long. Panicle terminal (leafy below), viscid with many-celled gland-tipped hairs; branches $2\frac{1}{2}$ by $\frac{1}{2}$ in.; flowers in clusters on the branches; lower clusters distinct, upper running into a dense spike; bracts $\frac{1}{4}$ in. long, oblong. Calyx $\frac{1}{4}$ – $\frac{1}{3}$ in. long, divided nearly to the base; segments 5, subequal, linear, glandular-hairy. Corolla-tube $\frac{1}{2}$ in. long; lips $\frac{1}{2}$ in. long, subentire, rather broad, curved. Stamens 2; filaments glabrous; anther-cells linear-oblong, muticous, parallel, one a very little below the other; pollen lenticular, with one stopple on each smooth face. Pistil glabrous; style very shortly 2-fid. Capsule $\frac{1}{2}$ in. long, flattened; stalk short, thick; seeds 4, with rough oblong tubercles.—*Ecteinanthus grandiflorus*, T. Anders. MS.

Mozamb. Dist. British Central Africa: Nyasaland; Shibisa (Chickwawa) to Tshinmuze, 2000–4000 ft., *Kirk!* Mount Sochi, *Meller!*

The corolla and the anthers of this plant are nearly those of *Adhatoda*, Benth. (*Duvernoia*, Lindau). The habit, leaves, bracts, pollen, and seeds are those of *Isoglossa*.

17. **I. floribunda**, *C. B. Clarke*. Upper leaves sessile, minutely pubescent. Panicle 17 by 5 in., terminal, nearly leafless, viscid-hairy, repeatedly divided; ultimate branches 3–4 in. long, on which the few-flowered distinct clusters form long one-sided spikes; bracts $\frac{1}{2}$ in. long, linear. Calyx $\frac{1}{10}$ – $\frac{1}{8}$ in. long; segments 5, linear, nearly free, viscous hairy. Corolla-tube $\frac{1}{3}$ in. long, much inflated in the upper half; lips $\frac{1}{3}$ in. long, subentire, rather broad. Stamens 2; filaments glabrous; anther-cells oblong, parallel, scarcely mucronate at the base, one slightly below the other; pollen globose compressed, with a stopple in the centre of either face. Pistil glabrous. Capsule $\frac{1}{2}$ in. long, ellipsoid, compressed, 4-seeded; stalk cylindrical, solid, short; placentæ not rising elastically from the base of valves; seeds rugose-tubercular

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; Shupanga, *Kirk!*

The very compound large leafless many-flowered panicles has caused this plant to be referred doubtfully in the Herbarium to *Rhinacanthus*, from which genus the shape of the corolla removes it.

18. **I. rubescens**, *Lindau in Engl. Jahrb.* xx. 57. Stem quadrangular, clothed upwards, as is the whole panicle, with hairs tipped by

red glands. Leaves 4 by $1\frac{3}{4}$ in., ovate, hairy on both surfaces; nerves reticulated beneath; petioles short. Panicle terminal, branched; flowers clustered, running into continuous spikes towards the tips of the branches; floral leaves lanceolate, larger in the lower part of the panicle. Calyx $\frac{2}{5}$ in. long. Corolla rose; tube $\frac{3}{4}$ in. long; lips $\frac{1}{3}$ in. long, both deeply lobed. Anther-cells at nearly equal height; pollen of the genus.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 344, and in Engl. Pfl. Ost-Afr. C. 372.

Nile Land. British East Africa: Ruwenzori, 9300–10,000 ft., *Stuhlmann*, 2397! 2424A!

19. **I. ixodes**, *Lindau in Engl. Jahrb.* xxii. 124. Branches pubescent upwards. Leaves 2 by $\frac{3}{4}$ in., ovate, margins near the base hairy; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. long. Panicle terminal, of closely contracted cymes; flowers sessile; floral leaves $\frac{1}{3}$ – $\frac{2}{3}$ in. long, ovate, acuminate, sessile; bracts $\frac{1}{4}$ in. long, linear. Sepals $\frac{1}{3}$ in. long, with long white multicellular hairs at the tip. Corolla glabrous, carmine; tube $\frac{3}{4}$ in. long, cylindric; lips nearly $\frac{1}{2}$ in. long. Anther-cells muticous, somewhat divaricate, one slightly below the other; pollen of the genus. Pistil glabrous, of the genus.

Mozamb. Dist. German East Africa: Ukami; Uluguru Mountains, near Lukwangulu, *Stuhlmann*, 9174!

49. **CHLAMYDOCARDIA**, *Lindau in Engl. Bot. Jahrb.* xx. 39.

Sepals 5, small, linear. Corolla slender, 2-lipped; tube narrow-cylindric; anticous lip 3-lobed, posticous emarginate. Stamens 2; anther-cells 2, elliptic, placed obliquely, nearly at equal height, not tailed at the base; pollen spherical, with 6 equatorial pores and meridional lines of raised points. Stigma subcapitate. Capsule small, stalked, 4-seeded; placentæ not rising elastically from the base of valves.—Herbs. Panicles terminal, linear-cylindric (or nearly reduced to racemes); floral leaves (in the two well-ascertained species) spatulate or obovate, prominent.

Species 2 or 3, endemic.

This differs from *Isoglossa* in the pollen and in the inflorescence, to which the peculiar floral leaves give a marked character.

Leaves pubescent; petiole 0 – $\frac{1}{8}$ in. long . . . 1. *C. Buettneri*.
Leaves glabrous; petiole $\frac{1}{2}$ – 1 in. long . . . 2. *C. subrhomboidea*.

1. **C. Buettneri**, *Lindau in Engl. Jahrb.* xx. 39. Stems 12–16 in. long, weak, creeping, rooting at the base, with 2 lines of minute crisped hair. Leaves up to $3\frac{1}{2}$ by $1\frac{1}{2}$ in., ovate-acute, much tapering at the base, minutely pubescent on the nerves; cystoliths on upper surface many, small; petiole 0 – $\frac{1}{3}$ in. long. Panicles terminal, up to 4 by 2 in., nearly glabrate; flowers in 1–4 clusters on the branches, sessile; floral leaf (or bract), $\frac{1}{3}$ – $\frac{1}{2}$ in. long, obcordate, sub-3-lobed, apiculate, on a linear petiolule, mostly 1-flowered, minutely gland-hairy on the margin; fruiting panicle-branches loose, but lower bracts imbri-

cated, almost substrobilate. Sepals 5, $\frac{1}{5}$ in. long, linear, minutely pubescent. Corolla-tube $\frac{1}{5}$ in. long, linear; lips $\frac{1}{10}$ in. long. Stamens 2; anther-cells 2, one slightly higher than the other, muticous; pollen globose, minutely tubercled on all sides, the tubercles in meridional lines; stopples 6, equatorial. Style nearly glabrous; stigma subcapitate. Capsule $\frac{1}{3}$ in. long, 4-seeded, glabrous; stalk $\frac{1}{10}$ in. long, solid; placentæ not rising elastically; seeds tubercular-scabrous.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 329.

Upper Guinea. Cameroons: Bipinde, 300 ft., Zenker, 1228! Victoria, Preuss, 1383!

Lower Guinea. Gaboon: Munda; Sibange Farm, Büttner, 469!

2. **C. subrhomboidea**, Lindau in Engl. Jahrb. xxii. 119. Herb, 16 in. high. Leaves $4\frac{1}{2}$ by $1\frac{3}{4}$ in., ovate, acuminate at either end, glabrous; petiole $\frac{1}{2}$ –1 in. long. Panicle terminal; floral leaves laxly imbricate, $\frac{1}{4}$ by $\frac{1}{5}$ in., rhomboid-ovate, subacute; bracts $\frac{1}{4}$ in. long, subulate. Sepals 5, $\frac{1}{5}$ in. long, subulate. Corolla $\frac{1}{2}$ in. long; tube very slender; lips short. Anther-cells muticous, nearly at equal height; pollen globose, obscurely subhexagonal, with many meridional lines of tubercles and 6 equatorial pores.

Upper Guinea. Cameroons: between Victoria and Bimbia, Preuss, 1309!

Doubtful species.

3. **C. (?) nuda**, C. B. Clarke. Bush, 6 ft. high. Stem minutely and sparsely pubescent; internodes long. Leaves $5\frac{1}{2}$ by $2\frac{1}{4}$ in., elliptic, acuminate, nearly glabrate, margin entire undulate, base slightly unequal, nearly cordate; cystoliths small on both faces; petiole $\frac{1}{2}$ – $2\frac{1}{2}$ in. long. Panicle linear, terminal, 6 by $\frac{1}{2}$ in., closely and minutely pubescent; floral leaves $\frac{1}{2}$ by $\frac{1}{12}$ in.; cymes 1-4-flowered, hardly $\frac{1}{5}$ in. long; bract and bracteoles $\frac{1}{4}$ in. long, linear. Sepals 5, subequal, nearly $\frac{1}{4}$ in. long, linear, acute. Corolla $\frac{1}{2}$ in. long, narrow, pubescent. Stamens 2 filaments glabrous; anthers 2, oblong, subequal, parallel, one somewhat above the other, ciliate at the top; pollen globose, with 12 longitudinal equidistant ribs not reaching the pores. Style slightly hairy towards the base.

Lower Guinea. Gaboon: Como River, Bates, 494!

It is worth remark that Bates, 495, where the stamens are 4 and the genus *Filetia*, is superficially extremely like this plant.

The present plant does for *Chlamydocardia*, but wants the characteristic bracts. I think there are 6 equatorial pores to the pollen, which, further, will not do for *Isoglossa*, whether there are 6 pores or 3.

50. **ECBOLIUM**, Kurz; Benth. et Hook. f. Gen. Pl. ii. 1118.

Sepals 5, nearly free, linear or narrow-lanceolate, small. Corolla distinctly 2-lipped; tube long and linear in *Eu-Ecbolium*, shorter and funnel-shaped or sub-cylindric in the section *Choananthus*; anticous lip

deeply 3-lobed; posticous lip subentire. Stamens 2, without rudiments of others; anther-cells 2, linear, muticous, nearly at equal height; pollen globose, with 3 meridional lines or bands and stopples. Ovary glabrous or hairy; ovules 2 in each cell; style branches 2, subequal, very small. Capsule ovoid, much flattened, 2-seeded, on a solid stalk; placentæ not rising elastically from the base of the valves; seeds in *Eu-Ecboium* rather large, much flattened, tubercular scabrous, without hairs, but in *Choananthus* often without tubercles, smooth or papillose or with minute hairs.—Shrubs, glabrous or hairy. Leaves entire, rather thick. Spikes terminal, many-flowered; bracts large, ovate or obovate, imbricate, enclosing the small calyx (in the Tropical African species); bracteoles linear, a little longer than the calyx.

Species 12; in Africa, Madagascar, Arabia and India.

Kurz grounded his genus *Ecboium* mainly on the shape of the corolla, which approaches that of *Rhinacanthus*. The subgenus *Choananthus* here added might, almost equally well, be attached to *Megalochlamys*.

*EU-ECBOLIUM.—Corolla-tube long, linear; posticous lip narrowed from an ovate base to a linear tip.

Bracts longer than the calyx.

Petiole short; leaves tapering into the petiole 1. *E. linneanum*.

Petiole 0.

Leaves glabrous, hastate, amplexicaul 2. *E. amplexicaule*.

Leaves hairy.

Leaves narrow at the base, auricled 3. *E. auriculatum*.

Leaves broad at the base, subcordate 4. *E. subcordatum*.

Bracts rather shorter than the calyx 5. *E. parvibracteatum*.

**CHOANANTHUS.—Corolla-tube narrowly funnel-shaped or cylindric; posticous lip oblong.

Bracts not 3-nerved.

Petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. long 6. *E. striatum*.

Petiole rarely attaining $\frac{1}{5}$ in., usually very short.

Seeds tubercular-scabrous, without hairs 7. *E. barlerioides*.

Seeds smooth, without tubercles.

Seeds shining, without hairs 8. *E. Anisacanthus*.

Seeds with scattered glochidiate hairs 9. *E. revolutum*.

Seeds shining, with very minute hairs 10. *E. hamatum*.

Bracts distinctly 3-nerved 11. *E. trinervium*.

1. ***E. linneanum***, *Kurz in Journ. As. Soc. Beng.* xl. part 2 (1871), 75. Leaves often 3 by $\frac{1}{3}$ in., tip triangular, obtuse, base narrowed, glabrous or obscurely puberulous; petiole 0– $\frac{1}{6}$ in. long; leaves varying from narrowly oblong to broadly ovate, also much in size. Spikes often 4 by 1 in., strobilate; bract $\frac{3}{4}$ by $\frac{2}{3}$ in., ovate, apiculate, often pubescent, entire or nearly so in the African examples, often strongly toothed in the Indian; bracteoles $\frac{1}{4}$ in. long, linear, hairy. Calyx $\frac{1}{5}$ in. long. Corolla-tube $\frac{3}{4}$ –1 in. long, linear to the top; lobes of antiposticous lip 3, $\frac{1}{3}$ – $\frac{1}{2}$ in. long, elliptic; posticous lip $\frac{1}{3}$ – $\frac{1}{2}$ by $\frac{1}{4}$ in. upwards, notched at the tip. Pollen globose; meridional smooth depressions very narrow, not reaching the poles. Ovary glabrous; style-base hairy. Capsule whole length $\frac{3}{4}$ in.; stalk linear-cylindric; head compressed, $\frac{1}{3}$ in. in

diam., containing 2 thin discoid margined slightly rough seeds.—Boiss. Fl. Or. iv. 526; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 544; Schweinf. & Volkens, Liste Pl. Somalis, 17; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 338, Fig. 135, G, and in Engl. Pfl. Ost-Afr. C. 371. *Justicia Ecbolium*, Linn. Sp. Plant. 15; Bot. Mag. t. 1847; Wight, Ic. t. 463; Nees in DC. Prod. xi. 426; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 111. *Eranthemum Ecbolium*, T. Anders. in Thwaites, Enum. Pl. Zeyl. 235.

Nile Land. Nubia: coast region, 3000–4000 ft., *Bent!* between Suakin and Berber; Singat, *Schweinfurth*, 277! and near Suakin, *Schweinfurth*, 127! Eritrea: Massowa, *Hildebrandt*, 724! *Schweinfurth & Riva*, 110! 210! Habab, 6000 ft., *Hildebrandt*, 465! Abyssinia: Wadi Togodele, *Ehrenberg!* and without precise locality, *Salt!* Somaliland; Ahl Mountains, 5000 ft., *Hildebrandt*, 860! Dauadid Torrent, *Ghika!* British East Africa: Ukamba, Machakos, *Scott-Elliot*, 6737! Taita; Maungu Mountain, *Scott-Elliot*, 6163! Lamu Island, *Kirk!*

Also in Arabia and India.

This plant, from the linear corolla-tube, stamens, and leaves, has been often sorted into *Eranthemum*, from which its large bracts should readily distinguish it.

2. **E. amplexicaule**, *S. Moore in Journ. Bot.* 1894, 136. Leaves 5 in. long, sessile, amplexicaul, panduriform-ob lanceolate, obtuse, glabrous. Anthers very shortly mucronate at the base. Capsule pubescent; otherwise as *E. linneanum*.—Lindau in Engl. Pfl. Ost-Afr. C. 371.

Nile Land. British East Africa: Sabaki River, 1300 ft., *Gregory!* Teita-Wanga, *Fischer*, 489!

Lower Guinea. Angola: Loanda, *Welwitsch*, 5203! 5124! Ambriz, *Monteiro!*

3. **E. auriculatum**, *C. B. Clarke.* Leaves up to $4\frac{1}{4}$ by 1 in., lanceolate, acuminate at both ends, hairy on both surfaces, subsessile, auriculate, $\frac{1}{8}$ – $\frac{1}{4}$ in. wide at the base. Corolla-tube $1\frac{1}{2}$ in. long, linear to the top; lobes $\frac{2}{3}$ in. long; otherwise as *E. linneanum*.

Mozamb. Dist. German East Africa: Maramo, *Stuhlmann*, 6987! Usambara, *Holst*, 608A! and without precise locality, *Hannington!*

4. **E. subcordatum**, *C. B. Clarke.* Leaves up to 3 by $1\frac{1}{4}$ in., subsessile, hairy on both surfaces, base broad, truncate or subcordate. Spike and bracts as of *E. linneanum*, but more hairy.

Nile Land. British East Africa: Ukamba (?) *Gregory!* Duruma, *Hildebrandt*, 2318!

5. **E. parvibracteatum**, *Rendle in Journ. Bot.* 1897, 379. Leaves up to 5 by $2\frac{1}{4}$ in., ovate, hairy on both faces, tip shortly acute, base obtuse. Petiole $\frac{1}{3}$ in. long, closely white-pubescent. Spike $1\frac{1}{2}$ – $2\frac{1}{2}$ in. long, rather dense; bracts $\frac{1}{8}$ – $\frac{1}{6}$ in. long, elliptic or oblong; shorter than the calyx. Corolla and capsule as of *E. linneanum*.

Nile Land. Somaliland: Waggar Mountains, *Mrs. Lort-Phillips!*

6. **E. striatum**, *Balf. f. in Proc. Roy. Soc. Edinb.* xii. 89. Leaves $1\frac{1}{2}$ by $\frac{2}{3}$ in. (up to $4\frac{1}{2}$ by 2 in. in *Thomas*, 11), ovate-elliptic or oblong, obtuse at either end, glabrous; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. long. Spikes up to 5 by $\frac{1}{2}$ in.; bracts $\frac{2}{3}$ by $\frac{1}{2}$ in., more or less pubescent. Sepals $\frac{1}{5}$ in. long. Corolla white (*Thomas*); tube $\frac{1}{2}$ in. long, narrowly funnel-shaped nearly from the base; lips $\frac{1}{3}$ in. long, posticous broadly oblong and scarcely emarginate. Anther-cells at equal height, linear-oblong, muticous, divaricate at the base; pollen globose, meridional smooth depressions very narrow, not reaching the poles. Capsule hardly exceeding $\frac{1}{2}$ in. in length, hairy; stalk $\frac{1}{5}$ in. long; seeds 2, ovoid, discoid, $\frac{1}{6}$ in. in diam., papillose-scabrous, without hairs.—*Balf. f. in Trans. Roy. Soc. Edin.* xxxi. 226, t. 77 (excluding var. β *minor*, and left-hand plant on t. 77); *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 338; *S. Moore in Journ. Bot.* 1894, 137.

Nile Land. British East Africa: Sabaki River, 1300 ft., *Gregory!* Tana River, *Thomas*, 11!

Also in Socotra.

7. **E. barlerioides**, *Lindau in Engl. Jahrb.* xx. 42. Younger branchlets and leaves closely covered with minute hairs. Leaves up to $1\frac{3}{4}$ by $\frac{2}{3}$ in., yellowish-green, narrowed at either end, obtuse, when mature glabrate; petiole $\frac{1}{8}$ in. long. Spikes terminal, strobilate, up to 2 by $\frac{3}{4}$ in.; bracts $\frac{2}{3}$ by nearly $\frac{1}{2}$ in., obovate, acuminate, base narrow cuneate. Calyx scarcely $\frac{1}{6}$ in. long. Corolla-tube $\frac{1}{2}$ – $\frac{2}{3}$ in. long, sub-cylindric or somewhat funnel-shaped at the top; anticous lip 3-lobed; posticous oblong, scarcely emarginate. Pollen globose, with 3 broad meridional bands continuous to the poles, and 3 large stopples. Capsule $\frac{1}{2}$ by $\frac{1}{3}$ in.; 2-seeded, much flattened, minutely hairy to the base; stalk solid; placentæ not rising elastically; seeds large, much flattened, tubercular-scabrous, not hairy.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 338, and in *Ann. Istit. Bot. Roma*, vi. (1896) 81. *Isoglossa barlerioides*, *S. Moore in Journ. Bot.* 1877, 70.

Nile Land. Eritrea: Keren, *Steudner*, 1503! Somaliland: Serrut Mountains, *Hildebrandt*, 1401! Ahi Mountains, 1250 ft., *Hildebrandt*, 860! Ganane River, *Riva*, 1110! Schebele River, *Donaldson Smith!*

8. **E. Anisacanthus**, *C. B. Clarke*. Small woody shrub; branchlets terete, minutely and densely white-hairy. Leaves $1\frac{1}{2}$ by $\frac{1}{2}$ in., narrowed at either end, densely and minutely hairy; petiole 0 – $\frac{1}{8}$ in. long. Spikes terminal, $1\frac{3}{4}$ by $\frac{1}{2}$ in., 8–12-flowered, hardly strobilate; bract $\frac{1}{2}$ by $\frac{1}{6}$ – $\frac{1}{5}$ in., elliptic, acute at either end, mucronate, minutely and sparsely hairy; bracteoles 2, linear, scarcely $\frac{1}{12}$ in. long. Calyx $\frac{1}{6}$ – $\frac{1}{5}$ in. long; sepals 5, united $\frac{1}{3}$ their length; two anticous often more highly united so that the calyx is 2-lipped, sub-4-fid. Corolla-tube $\frac{1}{3}$ in. long, linear-cylindric; limb 2-lipped, nearly as long; anticous lip 3-lobed; posticous lip shortly 2-fid. Stamens 2, rudiments 0; filaments minutely scabrous-hairy; anthers linear-oblong, muticous, parallel at equal height; pollen subglobose, smooth, with 3 very narrow bands (on which are stopples) not reaching the poles. Ovary glabrous; ovules

2 in each cell, lower smaller and soon shrivelling up; style slightly hairy towards the base; stigma shortly 2-lobed. Capsule $\frac{1}{3}$ in. long, obovoid, compressed, 2-seeded, hairy; stalk solid; placentæ not rising elastically from the base; seeds yellow, shining, very hard, smooth, without hairs or tufts.—*Justicia Anisacanthus*, Schweinf. in Verh. Zool.-Bot. Gesell. Wien, xviii. 678. *Schwabea Anisacanthus*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 346, and in Ann. Istit. Bot. Roma, vi. (1896) 82. *Monechma ciliatum*, Hochst. ex Nees in DC. Prod. xi. 411. *M. violaceum*, Nees in DC. Prod. xi. 411 partly.

Nile Land. Nubia: between Suakin and Berber, *Schweinfurth*, 130, 287! 425! Somaliland, *Riva*, 129, *Robecchi*, 305! *Donaldson Smith*! *Keller*, 206! 213! 215! 216! Abyssinia, 3000 ft., *Schimper*, 62! 1005! 1298A!

Schweinfurth observes that this plant is an *Ecbolium*, but he includes *Ecbolium* as a section in *Justicia*. It is not clear why Lindau has put it in *Schwabea*, as the seeds entirely want the two tufts of hairs on which that genus is poised, and the anther-cells are without tails.

9. **E. revolutum**, *C. B. Clarke*. Bracts broadly lanceolate, acute, imbricate, puberulous. Capsule sparsely hairy; seeds covered all over by very distant glochidiate hairs; otherwise as *E. Anisacanthus*.—*Schwabea revoluta*, Lindau in Engl. Jahrb. xx. 59, in Engl. & Prantl, Pflanzenfam. iv. 3 B. 346, and in Engl. Pfl. Ost-Afr. C. 372. *Barleria* sp., Schweinf. in Höhnel, Zum Rudolph-See u. Stephanie-See, Sonderabdr. 6.

Mozamb. Dist. German East Africa: Usambara; to the West of Pare Mountains, 600–2200 ft., *Höhnel*, 8!

10. **E. hamatum**, *C. B. Clarke*. Shrub; branches minutely tomentose-pubescent. Leaves up to $1\frac{1}{2}$ by $\frac{1}{2}$ in., oblong, pubescent; petiole $0-\frac{1}{4}$ in. long. Spikes terminal, short; bracts imbricate, up to $\frac{3}{4}$ by $\frac{1}{2}$ in., ovate, much acuminate, hairy; bracteoles $\frac{1}{5}$ in. long, linear. Sepals $\frac{1}{3}$ in. long, gland-hairy. Corolla-tube $\frac{1}{2}$ in. long, subcylindric; lips $\frac{1}{2}$ in. long, anticous 3-lobed, posticus oblong and subentire. Anther-cells muticous; pollen ellipsoid, pores 3. Capsule $\frac{1}{2}$ in. long, 2-seeded; seeds hairy.—*Blechum hamatum*, Klotzsch in Peters, Reise Mossamb. 220. *Petalidium* (?) *hamatum*, Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 299, and in Engl. Pfl. Ost-Afr. C. 367. *Schwabea ecbolioides*, Lindau in Engl. Jahrb. xx. 58, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 346, and in Engl. Pfl. Ost-Afr. C. 372.

Nile Land. British East Africa: Taita; Ndara Mountain, *Hildebrandt*, 2436!

Mozamb. Dist. German East Africa: Pangani Steppe, 2700 ft., *Volkens*, 552! and without precise locality, *Fischer*, 296! Portuguese East Africa: Lower Zambesi; Sena, *Peters*! British Central Africa: North Kalahari Desert, near Chukutusa Salt Pan, *Lugard*, 223!

11. **E. trinervium**, *C. B. Clarke*. Leaves $1\frac{1}{4}$ by $\frac{3}{4}$ in., rhomboid-ovate, obtuse. Bracts $\frac{1}{2}$ by $\frac{1}{4}$ in., broad-elliptic, narrowed at the base, distinctly 3-nerved, tip acuminate; otherwise as *E. hamatum*.—*Schwabea ecbolioides*, var. *tomentosa*, Lindau in Engl. Jahrb. xx. 59.

Mozamb. Dist. German East Africa, *Fischer*, 284!

51. **MEGALOCHLAMYS**, Lindau in Engl. Jahrb. xxvi. 345.

Sepals 5, nearly distinct, small, subequal, linear or linear-lanceolate. Corolla 2-lipped; tube linear-cylindric, rather shorter than the lobes; anticus lip 3-fid; posticus lip ovate-oblong, subentire. Stamens 2; anthers long-exserted, 2-celled, muticous; cells linear-oblong nearly at equal height; pollen ellipsoid, smooth, with two stopples. Pistil glabrous; ovules 2 in each cell; style very shortly and equally 2-lobed at the tip. Capsule stalked, ovoid, much flattened, usually 2-seeded; placentæ not rising elastically from the base of the capsule-valves; seeds rather large, much compressed, glabrous, somewhat tubercular-scabrous.—Shrubs. Leaves entire. Inflorescences terminal and axillary; floral leaves imbricated, with (commonly) 3 flowers in the axil of 1 or 2 of the upper; bracts and bracteoles 0 or only represented by bristles hardly $\frac{1}{2}$ in. long.

Species 3, endemic.

Engler & Schinz referred these plants to *Dicliptera*, which is untenable, as the placentæ do not rise elastically from the capsule valves; the inflorescence, moreover, is totally different, being that of *Phayloopsis*. The genus differs from *Ecbolium*, sect. *Choananthus*, mainly in the inflorescence.

Glabrous, or nearly so.

Leaves ovate, $\frac{1}{2}$ in. wide	.	.	.	.	.	1. <i>P. Marlothii</i> .
Leaves oblong, $\frac{1}{8}$ in. wide	.	.	.	.	.	3. <i>P. linifolia</i> .
Plant hairy all over	.	.	.	.	.	2. <i>P. strobilifera</i> .

1. **M. Marlothii**, Lindau in Engl. Jahrb. xxvi. 345. Glabrous, except the calyx. Leaves $1\frac{1}{2}$ by $\frac{1}{2}$ in., tip triangular, base obtuse; petiole $0-\frac{1}{10}$ in. long. Inflorescences $\frac{3}{4}$ –1 in. in diam., nearly enclosed by the two lowest floral leaves, which are $\frac{3}{4}$ by $\frac{2}{3}$ in., ovate, acute, with reflexed margins; upper floral leaves $\frac{1}{2}$ by $\frac{1}{8}-\frac{1}{6}$ in.; flowers 3–1 in the axil of the penultimate floral leaf (and sometimes of 1 or 2 adjacent). Calyx $\frac{1}{6}-\frac{1}{5}$ in. long, minutely pubescent. Corolla $\frac{3}{4}$ –1 in. in total length. Filaments glabrous. Capsule $\frac{1}{2}$ in. long, upper flattened part $\frac{1}{5}$ in. broad; seeds discoid, tubercular-scabrous, not hairy.—*Dicliptera Marlothii*, Engl. in Engl. Jahrb. x. 266. *D. schumanniana*, Schinz in Verhandl. Bot. Ver. Brandenb. xxxi. 204.

Lower Guinea. Angola: Monhinos, *Newton*! German South-west Africa: Amboland; Okasima-Ka-Namutenya, *Schinz*, 60! Oshando, *Schinz*, 100! Hereroland, 3300 ft., *Marloth*, 1313!

2. **M. strobilifera**, *C. B. Clarke*. Hairy all over. Leaves $2\frac{3}{4}$ by $\frac{3}{4}$ in., tip subacute, base obtuse; petiole $0-\frac{1}{8}$ in. long. Inflorescences $1\frac{1}{4}$ by $\frac{3}{4}$ in.; outermost floral leaves $\frac{2}{3}$ by $\frac{1}{3}$ in., obovate-elliptic, acuminate; upper gradually smaller, several containing 3–1 flowers in each axil; bracts and bracteoles 0. Corolla blue, with purple veins. Filaments granular-scabrous; pollen exactly as of *P. Marlothii*.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; near Tete, *Kirk*! There is no fruit of this species, but it is closely allied to the foregoing. The

anther-cells are linear-oblong, exactly parallel, and at equal height, which does not satisfy Anderson's diagnosis of his genus *Ecteinanthus* (*Rhytiglossa*); the inflorescence is really remote from that of *Ecteinanthus*.

3. **M. linifolia**, Lindau in *Engl. Jahrb.* xxvi. 346. Shrub, woody, much branched, glabrescent. Leaves $\frac{3}{4}$ by $\frac{1}{8}$ in., oblong, obtuse, subsessile, smooth, margins recurved, midrib glandular at the base. Axillary floral leaves $\frac{1}{2}$ by $\frac{3}{4}$ in., cordate, yellow-green, glabrous; inner floral leaves narrower with 2-3 flowers in the axil of each; flower bract and bracteoles 0 or minute. Sepals $\frac{1}{2}$ in. long, linear, scabrous. Corolla not seen. Capsule $\frac{1}{4}$ in. long, 2-seeded, glabrous; stalk short; placentæ not rising elastically; seeds tubercular, scabrous, hispid.—*Dicliptera* (?) *linifolia*, Lindau in *Ann. Istit. Bot. Roma*, vi. (1896) 80.

Nile Land. Somaliland; Abl Mountains, 1800-3300 ft., *Hildebrandt*, 830! Merehan, *Robecchi*, 249! 250; Bela, *Riva*, 1462!

52. GRAPTOPHYLLUM, Nees; Benth. et Hook. f. Gen.

Pl. ii. 1118.

Calyx small, divided nearly to the base into 5 subequal linear segments. Corolla definitely 2-lipped, moderately large, red; tube funnel-shaped, curved; anticus lip of 3 ovate reflexed lobes (central lobe outside in the bud); posticus lip ovate-oblong, very shortly 2-fid. Stamens 2 (2 rudiments added); anther-cells 2, linear-oblong, muticous, placed at equal height; pollen very short-ellipsoid, with 3 broad bands reaching the poles. Ovules 2 in each cell; style clavate, hardly 2-fid at the tip. Capsule (in Australian species) ellipsoid, 4-seeded, on a short solid cylindric stalk; placentæ not rising elastically from the base of the valves; seeds glabrous, nearly smooth, obscurely rugose-tubercular.—Glabrous shrubs. Panicles (almost racemes) many-flowered, terminal, sessile, rather dense; flowers pedicelled and subsessile, in clusters; bracts and bracteoles very small.

Species 2, in Malaya, Australia, and Polynesia, besides the subjoined.

1. **G. hortense**, Nees in *Wall. Pl. As. Rar.* iii. 102. Leaves up to 6 by $2\frac{1}{2}$ in., shortly narrowed at either end, entire; petiole $\frac{1}{3}$ in. long. Panicles 1-2 in. long, 10-40-flowered; pedicels $0-\frac{1}{3}$ in. long. Calyx $\frac{1}{8}$ in. long. Corolla-tube $\frac{3}{4}$ in. long; lips $\frac{1}{2}$ in. long.—DC. *Prod.* xi. 328; T. Anders. in *Journ. Linn. Soc.* vii. 51; C. B. Clarke in *Hook. f. Fl. Brit. Ind.* iv. 545; Lindau in *Bolet. Soc. Brot.* x. 147. *G. pictum*, Griff. *Notul.* iv. 139; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 327, fig. 132, A-D. *Justicia picta*, Linn. *Sp. Pl.* ed. ii. 21; *Bot. Mag.* t. 1870 (var. *luridosanguinea*).

Upper Guinea. Sierra Leone: in gardens, *Barter*! near Kitchom, *Scott-Elliot*, 4326! Cameroons, *Preuss*, 376! 401! *Staudt*, 4551!

This plant, often cultivated with blotched leaves, is doubtless only introduced at Sierra Leone; its native habitat is uncertain. Bentham gives, for the genus *Graptophyllum*, capsule usually 2-seeded. The capsules in the Australian species are 4-seeded.

53. **SCHAUERIA**, Nees; Benth. et Hook. f. Gen. Pl. ii. 1116.

Calyx divided nearly to the base into 5 subequal linear segments. Corolla distinctly 2-lipped; tube slender; anticous lip divided deeply into 3 oblong lobes; posticous lip subentire. Stamens 2, without rudiments; anther-cells 2, oblong, at equal height, rounded at the base; pollen ellipsoid, with 3 very narrow smooth bands that do not reach the poles. Ovules 2 in each cell; style minutely 2-lobed. Capsule (in the American species) stalked; seeds 4, rugose.—Leaves entire. Panicle terminal, dense, with many flowers; bracts linear.

Species 8, Brazilian; besides the one subjoined.

1. **S. populifolia**, *C. B. Clarke*. Herb, 4–5 ft. high, nearly glabrous. Leaves $4\frac{3}{4}$ by $2\frac{1}{4}$ in., elliptic, somewhat parallel-sided, acuminate, when mature glabrate, base rounded cordate; cystoliths numerous, small; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Panicle 2 by $\frac{1}{2}$ in., minutely puberulous; bracts $\frac{1}{2}$ in. long, linear, nearly glabrous, with a very few long-stalked glands. Calyx $\frac{1}{4}$ in. long; lobes subulate, dilated and connate at the base. Corolla reddish (*Zenker*); tube $\frac{1}{3}$ in. long, very slender; lobes $\frac{1}{3}$ in. long. Filaments glabrous; anther-cells slightly hairy at the top. Pistil glabrous. Capsule not seen.

Upper Guinea. Cameroons: Bipinde, *Zenker*, 1205! Fernando Po, *Mann*, 1426! *Vogel*!

54. **PERISTROPHE**, Nees; Benth. et Hook. f. Gen. Pl. ii. 1121.

Calyx small; segments 5, subequal, nearly separate, linear-lanceolate. Corolla lips 2, long, posticous entire or emarginate. Stamens 2; anthers 2-celled; cells one more or less above the other, muticous; pollen ellipsoid, with 3 smooth bands and stopples, not tubercled. Ovules 2 in each cell; style filiform, with 2 very short oblong branches. Capsule 4-seeded, with a cylindric stalk; placentæ not rising elastically; seeds discoid, smooth or minutely papillose.—Herbs. Leaves entire. Spikelets 2–1- (rarely 3-) flowered, in heads or scattered; bracts to the 2 lower flowers subopposite, enclosing the calyx, from linear to ovate; bracteoles 2 to each flower, linear-lanceolate, longer than the calyx.

Species 20, in the warmer regions of the Old World extending from Cape Verd Islands and the Cape to Malaya. This genus in habit and in every point is *Dicliptera*, except that the placentæ do not rise elastically from the base of the capsule-valves in the ripe fruit.

Spikelets in more or less lax panicles.

Panicles 12–18 in. long 1. *P. bicalyculata*.

Panicles denser with more numerous spikelets 2. *P. Hensii*.

Spikelets in spikes.

Stout; spikes 3 by 1 in.; corolla $\frac{3}{4}$ –1 in. long 3. *P. luteoviridis*.

Small; spikes 1 by $\frac{1}{4}$ in.; corolla $\frac{1}{2}$ in. long 4. *P. usta*.

1. **P. bicalyculata**, *Nees in Wall. Pl. As. Rar.* iii. 113. Glabrous or very thinly hispid. Branches up to 2–4 ft. long, 4–7-angular.

Leaves up to 4 by $1\frac{1}{2}$ in., elliptic-lanceolate; petiole $\frac{1}{3}$ in. long; leaves usually smaller and very few in the inflorescence. Panicles often 12–18 in. long, very lax, much divided, spikelets with but one perfect flower; bracts $\frac{1}{3}$ in. long. Calyx scarcely $\frac{1}{4}$ in. long, minutely puberulous. Corolla $\frac{1}{2}$ in. long, pale purple. Capsule $\frac{1}{3}$ in. long, hairy at the top; seeds minutely papillose.—DC. Prod. xi. 496; Benth. in Hook. Niger Fl. 484; A. Rich. Tent. Fl. Abyss. ii. 160; T. Anders. in Journ. Linn. Soc. vii. 47; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 113, 244; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 554; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 331, in Engl. Pfl. Ost-Afr. C. 371, and in Ann. Istit. Bot. Roma, vi. (1896) 80. *P. kotschyana*, Nees in DC. Prod. xi. 497; A. Rich. Tent. Fl. Abyss. ii. 160; Zarb, Cat. Spéc. Bot. Pfund, 32. *Dianthera bicalyculata*, Retz. in Acta Holm. 1775, 297, t. 9. *D. malabarica*, Linn. f. Suppl. 85. *Justicia bicalyculata*, Vahl, Symb. ii. 13. *J. ligulata*, Lam. Ill. t. 12, fig. 2; Cav. Ic. i. 52, t. 71.

Upper Guinea. Cape Verd Islands: St. Iago, *Welwitsch*, 5176! Senegal, *Lelièvre!* *Perrottet!* *Roger!* Gambia, *Boteler!* Cape Verd, *Smith!* Niger Territory: Borgu, *Barter*, 767! Bornu; Kuka, *Vogel*, 34!

Nile Land. Nubia: coast region, *Bent!* *Schweinfurth*, 348! Khartoum, *Schweinfurth*, 772! 795! Kordofan, *Pfund*, 405! 406! 438! *Kotschy*, 50! 161! Eritrea: Acrur, 6000 ft., *Schweinfurth & Riva*, 726! Bogos; Tsad Amba, *Steudner*, 1517! Sarat, *Steudner*, 1516! Keren, *Steudner*, 1514! Abyssinia: Jelajeranne, *Schimper*, 694! Haramat district near Geraz, *Schimper*, 1095! Jaja, *Schimper*, 289! Togodele, *Ehrenberg!* and without precise locality, *Salt!* *Schimper*, 666! 1511! Somaliland, *Robecchi*, 242! 251!

Lower Guinea. German South-west Africa: Hereroland, 3300 ft., *Marloth*, 1312! Amboland; Oshando, *Schinz!*

Mozamb. Dist. German East Africa: Kilimanjaro, *Volkens*, 452! British Central Africa: Stevenson Road, 4000–5000 ft., *Scott-Elliot*, 8247! Eastern Bechuanaland: Tati, *Holub!*

2. **P. Hensii**, *C. B. Clarke*. Panicle large with strongly hexagonal branches, much denser, with larger spikelets; otherwise as *P. bicalyculata*.—*Dicliptera Hensii*, Lindau in Engl. Jahrb. xxii. 120.

South Central. Lower Congo: Stanley Pool, 1000 ft., *Hens*, 53!

This is a *Peristrophe* (closely allied to *P. bicalyculata*, which has invariably a more straggling panicle) identical with one from Natal and Kaffraria.

3. **P. luteoviridis**, *C. B. Clarke*. Stout herb, glabrous except the inflorescence, yellow-green. Leaves up to $3\frac{3}{4}$ by 1 in., narrowed at both ends; petiole $\frac{1}{4}$ in. long. Clusters of flowers approximated in rather dense spikes 3 by 1 in.; floral leaves up to $\frac{3}{4}$ by $\frac{1}{4}$ in., intermixed. Spikelets 1-flowered; bract $\frac{1}{3}$ – $\frac{1}{2}$ in. long, lanceolate; bracteoles $\frac{1}{2}$ in. long, linear. Calyx $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Corolla $\frac{3}{4}$ –1 in. long, rose, purple-spotted (*Schweinfurth*). Anther-cells at nearly equal height, rounded at the base; pollen ellipsoid with 3 stopples, on the longitudinal smooth bands are single rows of minute spots, one row on each side of each stopple. Capsule $\frac{3}{4}$ in. long, stout, solid-stalked; seeds 4, discoid, smooth.—*Nicotaba lanceolata*, Lindau in Engl. Jahrb. xx. 38, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 329.

Nile Land. Dar Fertit: at Dem Bekir, *Schweinfurth*, ser. 3, 23! Niamniam, *Schweinfurth*, 2885!

4. ***P. usta***, *C. B. Clarke*. Dusky, pubescent. Branches 3–5 in. long, very numerous, arising after a grass-fire from the woody rootstock. Leaves up to 1 by $\frac{1}{3}$ in., tip hardly acute, base narrowed; petiole up to $\frac{1}{5}$ in. long. Spikelets 1-flowered, in mainly terminal spikes up to 1 by $\frac{1}{3}$ in., lax; floral leaves $\frac{1}{4}$ in. long, linear-oblong. Calyx scarcely $\frac{1}{8}$ in. long. Corolla $\frac{1}{2}$ in. long, slender. Stamens 2; anther-cells 2, one clearly above the other; pollen as of *P. luteoviridis*. Capsule $\frac{3}{4}$ in. long, slender, 4-seeded, the linear stalk exceeding $\frac{1}{3}$ in. in length.—*Duvernoia pumila*, Lindau in *Engl. Jahrb.* xx. 44, and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 339, and in *Engl. Pfl. Ost-Afr.* C. 372.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Zomba, 4000–6000 ft., *Whyte!* *Buchanan*, 127! Tanganyika Plateau, *Carson!*

55. **HYPOESTES**, R. Br.; Benth. et Hook. f. *Gen. Pl.* ii. 1122.

Sepals 5, equal, small, scarious, minutely puberulous, free or united $\frac{1}{3}$ – $\frac{2}{3}$ their length, lanceolate. Corolla small (in Tropical African species), 2-lipped half its length, rose-purple to white (often spotted); tube slender, dilated near the top; anticous lip 3-fid; posticous lip 2-fid, emarginate or entire, within in the bud. Stamens 2; anthers 1-celled, muticous; pollen ellipsoid, longitudinally banded, bands and stopples usually 3. Style filiform, shortly and equally 2-fid at the tip; ovary glabrous or somewhat hairy upwards, with 2–1 ovules in each cell. Capsule small, stalked, 4- or 2-seeded; seeds smooth or pustular-tubercled.—Herbs or shrubs. Leaves entire, wavy, or (in *H. microphylla*) obscurely toothed. Inflorescences axillary and terminal, or running into terminal spikes or panicles. Spikelets in cymes, elongate or subcapitate; floral leaves resembling reduced vegetative leaves often present; spikelets with two bracts, lower containing a flower, upper empty or with a rudimentary flower; the 2 bracts free or connate $\frac{1}{3}$ – $\frac{2}{3}$ their length; bracteoles to the lower bract 2, shorter than it, oblong; bracteoles to the upper bract usually 0.

Species 60, extending from Africa to Australia.

*APOLYTON.—Two opposite bracts to the spikelet free, equal, or somewhat unequal.

Two bracts of the spikelet with long linear green points (sometimes not very long in *H. cancellata*).

Seeds smooth.

Heads subglobose, chiefly axillary.

Leaves $1\frac{1}{2}$ in. long	1. <i>H. aristata</i> .
Leaves 2–4 in. long	2. <i>H. antennifera</i> .
Leaves 6 in. long, glabrate	3. <i>H. insularis</i> .

Heads subglobose, many subterminal approximate	4. <i>H. Staudtii</i> .
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Inflorescences elongate, lax	5. <i>H. Barteri</i> .
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Seeds tubercled; heads dense, oblong, compound	6. <i>H. cancellata</i> .
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Two opposite bracts of spikelet obtuse or acute, scarcely mucronate.

Spikelets 1-5 together, laxly capitate.

Leaves usually much exceeding $\frac{1}{2}$ in. in length.

- | | |
|--|------------------------------|
| Two outer bracts narrowly obovate, subequal | 7. <i>H. triflora</i> . |
| Two outer bracts obovate, larger, unequal | 8. <i>H. phaylopsoides</i> . |
| Two outer bracts narrowly elliptic-oblong | 9. <i>H. rosea</i> . |
| Leaves $\frac{1}{2}$ in. long, obscurely toothed | 10. <i>H. microphylla</i> . |
| Inflorescences densely strobilate, compound | 11. <i>H. strobilifera</i> . |

**HEMICYLINDRUS.—Two opposite bracts to spikelet connate $\frac{1}{3}$ – $\frac{2}{3}$ their length into a tube (“involucre” of Lindau).

Spikelets in short unilateral cymes, rather densely approximate.

Bracts without long white hairs, glabrate or minutely scabrous hairy

- | | |
|---|-------------------------------|
| | 12. <i>H. Forskalei</i> . |
| Stem and leaves minutely canescent | 13. <i>H. Hildebrandtii</i> . |
| Pubescent. (Calyx larger, $\frac{1}{4}$ in. long) | 14. <i>H. mlanjensis</i> . |

Bracts with (more or less numerous) spreading long white hairs.

- | | |
|---|-------------------------------|
| Leaves ovate or elliptic, narrowed on the petiole | 15. <i>H. verticillaris</i> . |
| Leaves elliptic, long acuminate | 16. <i>H. Preussii</i> . |

Spikelets in lax cymes; cymes in compound panicles.

- | | |
|---|--------------------------------|
| Spikelets rather small | 17. <i>H. violaceotincta</i> . |
| Spikelets $\frac{1}{2}$ in. long, mostly solitary and distant | 18. <i>H. tanganyikensis</i> . |

1. **H. aristata**, *R. Br. Prod.* 474. Small pubescent shrub, 8–30 in. high. Leaves 1–2 by $\frac{1}{2}$ –1 in., ovate, narrowed at both ends; petiole 0– $\frac{2}{3}$ in. long. Heads globose, axillary, distant, of numerous one-flowered spikelets, frequently with reduced petioled leaves $\frac{1}{3}$ in. long; upper heads not running into linear or oblong inflorescences. Spikelets with 4 free bracts; 2 outer opposite, $\frac{1}{5}$ in. long, oblong, with a subulate scabrous tail $\frac{1}{5}$ in. long; inner bracts (bracteoles) lateral, $\frac{1}{8}$ – $\frac{1}{5}$ in. long, oblong. Sepals nearly free. Corolla $\frac{2}{3}$ in. in total length. Filaments and style nearly glabrous. Capsule $\frac{1}{2}$ in. long, glabrous; seeds 4, smooth.—Nees in *DC. Prod.* xi. 509; T. Anders. in *Journ. Linn. Soc.* vii. 48; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 333, and in *Engl. Pfl. Ost-Afr. C.* 371. *Justicia aristata*, Vahl, *Symb.* ii. 2.

Mozamb. Dist. German East Africa: Kilimanjaro, ex *Lindau*; Uluguru, *Stuhlmann*, 9128! British Central Africa: Nyasaland; Nyika Mountains, 4000–6000 ft., *Whyte*!

Also in South Africa.

2. **H. antennifera**, *S. Moore in Journ. Bot.* 1880, 41. Leaves up to 4 by 2 in. Outer bracts $\frac{1}{2}$ –1 in. long. Corolla 1 in. long or rather more; otherwise as *H. aristata*.—*Oliv.* in *Trans. Linn. Soc.* ser. 2, *Bot.* ii. 346; Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 333, and in *Engl. Pfl. Ost-Afr. C.* 371. *H. aristata*, var. *macrophylla*, Nees in *DC. Prod.* xi. 510. *H. plumosa*, Drège, *Zwei. Pfl. Docum.* 153, 159, name only.

Nile Land. British East Africa: Taita; Ndi Mountain, *Hildebrandt*, 2563! and Maungu Mountain, 2000 ft., *Johnston*! Lykipia, 6000–8000 ft., *Thomson*!

Ukamba, 5000–6000 ft., *Scott-Elliot*, 6485! West of Lake Albert, *Stuhlmann*, 3009!

Mozamb. Dist. German East Africa: Kilimanjaro, 6000 ft., *Johnston*, 165! Usambara; Kwa Mshuza, *Holst*, 8918! British East Africa: Nyasaland; between Mpata and Tanganyika Plateau, 2000–3000 ft., *Whyte*! Kondowe to Karonga, 2000–6000 ft., *Whyte*! Masuka Plateau, 6500–7000 ft., *Whyte*, 307! Nyika Mountains, 4000–6000 ft., *Whyte*! Nyika Plateau, 6000–7000 ft., *Whyte*!

Also in South Africa.

S. Moore says that in *Hildebrandt*, 2563, the seeds are tuberculate; I find them smooth.

3. **H. insularis**, *T. Anders. in Journ. Linn. Soc.* vii. 49. Very sparsely hairy. Branches 15 in. long. Leaves 6 by $2\frac{1}{2}$ in., thinly hairy on the nerves and margin; petiole $\frac{3}{4}$ in. long. Heads globose, axillary, distant, of numerous 1-flowered spikelets; upper heads hardly running into oblong inflorescences. Spikelets with 4 bracts; 2 outer opposite, $\frac{1}{4}$ in. long, with a subulate scabrous tail $\frac{1}{4}$ in. long. Sepals nearly free. Corolla 1 in. in total length, purple. Filaments thick, nearly glabrous, minutely scabrous.

Upper Guinea. Cameroons: Rio del Rey, *Johnston*! Cameroon Mountain, 2500 ft., *Mann*, 1951! Fernando Po, *Mann*, 179!

Lower Guinea. Gaboon; Como River, *Bates*, 482!

Closely allied to *H. aristata*, R. Br.

4. **H. Staudtii**, *Lindau in Engl. Jahrb.* xxii. 122. Leaves 5 by 2 in., nearly glabrous. Heads numerous, approximated in the upper part of the branches. Corolla about $\frac{2}{3}$ in. long. Capsule nearly glabrous; seeds 4, smooth; otherwise as *H. insularis*.

Upper Guinea. Cameroons: Yaunde, 2500 ft., *Zenker & Staudt*, 36!

Possibly a variety of *H. insularis*, T. Anders.

5. **H. Barteri**, *T. Anders. in Journ. Linn. Soc.* vii. 49. Minutely pubescent. Leaves up to 6 by $2\frac{1}{2}$ in., glabrate or minutely hairy on the nerves; petiole up to $\frac{3}{4}$ in. long. Spikes simple or panicles linear, axillary and terminal, often $2\frac{1}{2}$ by $\frac{1}{2}$ in. and lax, sometimes 5 by $\frac{3}{4}$ in. compound, denser and long-peduncled. Spikelets of 2 bracts, 2 bracteoles and 1 purple-red flower; 2 bracts opposite, free, $\frac{1}{4}$ in. long, oblong, with a subulate tail $\frac{1}{4}$ in. long. Sepals free. Corolla $\frac{2}{3}$ in. long. Filaments and pistil glabrous.—*Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 333. *H. triticea*, *Lindau in Engl. Jahrb.* xx. 51, and in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 333.

Upper Guinea. Lagos: Eppah, on the Kradu Lagoon, *Barter*, 3285! and without precise locality, *Millen*, 35 of 1896 collection! Cameroons: Victoria, *Buchholz! Preuss*, 1164!

6. **H. cancellata**, *Nees in DC. Prod.* xi. 505. More or less hairy. Stems up to 2 ft. long, geniculate. Leaves up to 2 by $\frac{1}{3}$ in., oblong, narrowed at either end; cystoliths transverse, not conspicuous; petiole $0-\frac{1}{8}$ in. long. Heads mainly terminal (a few axillary added) up to $1\frac{1}{2}$ by $\frac{3}{4}$ in., very dense, in congested panicles, prominently yellow-hispid;

outer floral leaves narrow, hardly imbricate. Spikelets 1-flowered; bracts free, 2 outer $\frac{1}{4}$ – $\frac{1}{3}$ in. long, oblong, with a linear tail $\frac{1}{10}$ – $\frac{1}{4}$ in. long. Corolla $\frac{2}{3}$ – $\frac{3}{4}$ in. long, red. Pollen oblong-ellipsoid, more elongate than in the preceding species. Capsule $\frac{1}{4}$ in. long, very slender; seeds 4, small, tubercled.—Benth. in Hook. Niger Fl. 484. *H. callicoma*, S. Moore in Journ. Bot. 1880, 41; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333. *Justicia cancellata*, Willd. ex Nees in DC. Prod. xi. 506.

Upper Guinea. Sierra Leone: Wallia, *Scott-Elliott*, 4265! Lester Peak, *Scott-Elliott*, 3843! and without precise locality, *Afzelius*!

Nile Land. Bongo: Addai, *Schweinfurth*, 2525!

Lower Guinea. Angola: Bembe Mountain, *Monteiro*! Malange, *Marques*, 312!

South Central. Lunda: Mukenge, *Pogge*, 306! 1201; Monbuttu, *Schweinfurth*, 3392!

This plant superficially resembles closely *Justicia procumbens*, Linn. The length of the tail to the 2 outer bracts varies a good deal, and the distribution of the species is unusually scattered.

7. **H. triflora**, *Roem. et Schultes*, *Syst.* i. 141. Stems 1–4 ft. long, more or less hairy. Leaves up to 3 by $1\frac{1}{2}$ in., ovate, entire or crenulate, obscurely toothed, hispid with scattered white 1–4-celled hairs; cystoliths irregularly scattered, many transverse, conspicuous; petiole $\frac{1}{4}$ – $1\frac{1}{4}$ in. long. Heads of 1–5 (often 3) 1-flowered spikelets, often apparently terminal on lateral branches $\frac{1}{2}$ –2 in. long; floral leaves much reduced, often shorter than the spikelets. Outer 2 bracts of spikelet free, $\frac{1}{3}$ in. long, narrowly obovate-oblong. Sepals free. Corolla $\frac{3}{4}$ in. in total length, pink or white. Filaments glabrous. Style with a few long hairs. Capsule $\frac{1}{2}$ in. long, with 4 tubercled seeds.—Nees in DC. Prod. xi. 506; A. Rich. Tent. Fl. Abyss. ii. 162; T. Anders. in Journ. Linn. Soc. vii. 50; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 557; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 111, 243; Engl. Hochgebirgsfl. Trop. Afr. 394; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333. *H. adoensis*, A. Rich. Tent. Fl. Abyss. ii. 162; Engl. Hochgebirgsfl. Trop. Afr. 394 and var. *Andersoni*, Engl. l.c. 395; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333. *H. simensis*, Hochst. ex Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 111; Engl. Hochgebirgsfl. Trop. Afr. 395. *H. inaequalis*, Lindau in Engl. Jahrb. xx. 50. *H. ciliata*, Lindau in Engl. Jahrb. xx. 51, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333. *H. acuminata*, Hochst. ex Nees in DC. Prod. xi. 506. *Justicia triflora*, Forsk. Fl. Ægypt.-Arab. 4; Vahl, Symb. i. 3.

Upper Guinea. Cameroons: Buea, 6500–8000 ft., *Preuss*, 732! 745! Cameroon Mountain, 7000 ft., *Mann*, 1979! Fernando Po, 5000 ft., *Mann*, 580!

Nile Land. Eritrea: Saganeiti, in Goua Gorge, 6800–7100 ft., *Schweinfurth* & *Riva*, 1290! Abyssinia, *Salt*! *Pearce*! *Schimper*, 108! 149! 340! 386! 389! 418! 600! 641! 926! 934! 939! 1104! 1111! 1491! 1985! 2818! *Quartin-Dillon* & *Petit*! *Petit*! *Roth*, 484! British East Africa: Ruwenzori, 5000–6000 ft., *Scott-Elliott*, 7856! 8000–9000 ft., *Scott-Elliott*, 7560!

Extending eastward to India.

H. ciliata, Lindau, is described as having the calyx divided only half-way down, but I find it divided to the base in the type specimen. *H. adoensis*, Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 111, is said to be *Dicliptera roxburghiana*, Nees. This latter is a typical *Dicliptera*, abundant in India, and though not yet known from Tropical Africa, several of the Tropical African *Diclipteras* are very near it. If, however, *Hypoestes adoensis*, Solms-Laub., was really one of these, it was not congeneric even with *Hypoestes adoensis*, A. Rich.

8. **H. phaylopsoides**, *S. Moore in Trans. Linn. Soc. ser. 2, Bot. iv. 34.* Two outer bracts of the spikelet unequal, lower often $\frac{3}{4}$ by $\frac{1}{4}$ in., elongate-obovate, upper $\frac{1}{2}$ in. long, otherwise as *H. triflora*.—Lindau in Eng. Pfl. Ost-Afr. C. 371. *H. kilimandscharica*, Lindau in Engl. Jahrb. xix. Beibl. No. 47, 47, and in Engl. Pfl. Ost-Afr. C. 371.

Mozamb. Dist. German East Africa: Kilimanjaro, 3300 ft., *Volkens*, 1663! British Central Africa: Nyasaland, Masuka Plateau, 6500–7000 ft., *Whyte!* Mount Mlanje, *Whyte*, 126!

This species is very near the large-leaved states of *H. triflora*, but the lower bract to spikelet is broader and leaflike.

9. **H. rosea**, *Beauv. Fl. Owar. ii. 67, t. 100, fig. 1.* Sparsely hairy or glabrate. Upper leaves $1\frac{1}{2}$ by $\frac{2}{3}$ in., ovate, acuminate, short-petioled; lower leaves up to $6\frac{1}{2}$ by $2\frac{1}{4}$ in. with a petiole $1\frac{3}{4}$ in. long. Heads of 1–5 1-flowered spikelets, terminal or axillary, sessile or peduncled; floral leaves narrow oblong, usually much shorter than the spikelet, sometimes $\frac{3}{4}$ by $\frac{1}{10}$ in. Outer 2 bracts of spikelet free, $\frac{1}{4}$ – $\frac{1}{3}$ in. long, oblong, narrowed in the upper half. Corolla $\frac{3}{4}$ in. in total length, rose; otherwise nearly as *H. triflora*.—Nees in DC. Prod. xi. 506; Benth. in Hook. Niger Fl. 484. *H. consanguinea*, Lindau in Engl. Jahrb. xx. 50, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333.

Upper Guinea. Togoland, *Büttner*, 315! *Kling*, 189! Benin, *Beauvois*. Cameroons: Buea, *Preuss*, 599!

Lower Guinea. Island of St. Thomas, *Don!*

Bentham says that G. Don's example has no flowers, and refers it here with a query. But it has good buds and inflorescences. It shows some linear-oblong floral leaves outside the head of spikelets; throughout *Hypoestes* the absence or prominence of these reduced leaves varies much on one plant.

10. **H. microphylla**, *Nees in DC. Prod. xi. 504, not of Baker.* Small, woody, much-branched, viscous hairy. Leaves $\frac{1}{3}$ by $\frac{1}{8}$ in., subsessile, toothed. Spikelets 1-flowered, 1–3 together, scattered, subsessile; bracts free, 2 outer $\frac{1}{3}$ in. long, oblong, obtuse. Sepals $\frac{1}{6}$ in. long, nearly free. Corolla $\frac{1}{2}$ in. in total length. Capsule scarcely $\frac{1}{2}$ in. long, viscous hairy; seeds 4, tubercled.—A. Rich. Tent. Fl. Abyss. ii. 164. *H. uniflora*, T. Anders. in Journ. Linn. Soc. vii. 48; Hochst. in Flora, 1841, i. Intell. 24, name only.

Nile Land. Abyssinia: Amba Sea, *Schimper*, 573! Mount Sholoda, near Adowa, *Schimper*, 400! and without precise locality, *Schimper*, 1623!

11. **H. strobilifera**, *S. Moore in Journ. Bot. 1880, 40.* Closely pubescent. Stems 1–2 ft. long. Leaves $5\frac{1}{2}$ by $\frac{1}{2}$ in. linear-oblong, base often rounded; cystoliths on both surfaces many, prominent; petiole

0– $\frac{1}{8}$ in. long. Heads 1–1 $\frac{1}{4}$ in. long, ovoid, terminal, densely strobilate; outer floral leaves spatulate-obovate, suddenly acuminate, rigid, closely imbricate, with 1–3 spikelets under each. Bracts free, 2 outer $\frac{1}{8}$ in. long, oblong. Sepals $\frac{1}{6}$ in. long, free. Corolla $\frac{2}{3}$ in. long. Pistil glabrous except for a few hairs near the top of the ovary. Capsule $\frac{1}{4}$ – $\frac{1}{3}$ in. long; seeds 4, tubercled.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333.

Nile Land. Bongo: Addai, *Schweinfurth*, ser. 3, 30! 2553!

12. **H. Forskalei**, *R. Br. Prod.* 474, *in obs.* Small shrub, 1–2 ft. high, nearly glabrous except the inflorescence. Leaves 2 by $\frac{2}{3}$ in., elliptic-lanceolate, acuminate to an obtuse point, midrib glabrous beneath in the type form (*Steudner*, 1524), or minutely scabrous hairy in the forms called *H. annua* and *H. Rothii*; petiole 0– $\frac{1}{3}$ in. long. Inflorescences axillary, and running into a narrow terminal panicle; spikelets mostly in unilateral cymes $\frac{1}{2}$ –1 $\frac{1}{2}$ in. long; floral leaf to spikelet mostly $\frac{1}{8}$ – $\frac{1}{6}$ in. long, ovate. Two outer bracts of spikelet united for half their length into a tube (involucre of Lindau), their free portions lanceolate, sub-obtuse, minutely pubescent, without glands or long white hairs. Calyx $\frac{1}{6}$ in. long, tubular for $\frac{1}{2}$ its length, minutely pubescent, scarious; segments 5, lanceolate, subacute. Corolla $\frac{1}{3}$ – $\frac{1}{2}$ in. long, hairy without. Filaments rather thick, glabrous above, hairy below; pollen ellipsoid, with 3 stopples. Pistil glabrous in the type form; sometimes with a few hairs near the top of the ovary and on the base of the style. Capsule $\frac{1}{4}$ in. long, those seen 2-seeded; seeds smooth.—A. Rich. Tent. Fl. Abyss. ii. 163; T. Anders. in Journ. Linn. Soc. vii. 49; Solms-Laub. in Schweinf. Beitr. Fl. Aethiop. 111, 243; R. Br. in Salt, Abyss. Append. 62; Nees in DC. Prod. xi. 507; Zarb, Cat. Spéc. Bot. Pfund, 32; Engl. Hochgebirgsfl. Trop. Afr. 394; Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333, and in Engl. Pfl. Ost-Afr. C. 371, and in Ann. Istit. Bot. Roma, vi. (1896) 81. *H. annua*, Steud. Nomencl. ed. 2, i. 791. *H. Rothii*, T. Anders. in Journ. Linn. Soc. vii. 49. *Justicia paniculata*, Forsk. Fl. Ægypt.-Arab. 4. *J. Forskalei*, Vahl, Symb. i. 2.

Nile Land. Kordofan: Abou Hefe, *Pfund*. Eritrea: Keren, *Steudner*, 1524! 1529! Kazen, 8000 ft., *Rohlf's & Stecker!* Habab, 7000 ft., *Hildebrandt*, 456! Abyssinia, widely spread, 5000–9000 ft., *Schimper*, 29! 35! 241! 350! 390! 405! 1861! *Roth*, 485! *Petit!* *Salt!* *Pearce!* *Plowden!* Somaliland: Berbera, *Riva*, 111! between Lafaru and Herer, *Riva*, 29! Danna Torrent, *Riva*, 838! Ogaden. *Robecchi*, 244! 246! 257!

Lower Guinea. Angola: Huilla, *Newton*, 120! *Antunes*, 84!

Mozamb. Dist. British Central Africa: Nyasaland, Kondowe to Karonga, 2000–6000 ft., *Whyte!*

Also in Arabia.

This plant is also said to grow on Kilimanjaro by Lindau; but, as it has been considered merely a glabrescent form of *H. verticillaris*, R. Br., it is not possible to separate out either the synonymy or the distribution completely. The plant above referred here from Nyasaland may belong to *H. verticillaris*, R. Br., var. *glabra*, S. Moore.

13. **H. Hildebrandtii**, *Lindau in Engl. Jahrb.* xx. 48. Stems, and nearly the whole plant, densely and minutely canescent. Leaves

oblong, or narrow-elliptic, obtuse; otherwise as *H. Forskalei*.—Engl. & Prantl, Pflanzenfam. iv. 3 B. 333, and in Ann. Istit. Bot. Roma, vi. 1896, 81.

Nile Land. Eritrea: Saganeiti, 7000 ft., *Schweinfurth & Riva*, 1209! 1716! Mount Kube, 6000 ft., *Schweinfurth & Riva*, 1515! Somaliland: Golis Range, *Mrs. Lort-Phillips! Miss Edith Cole!* Dononati, *Riva*, 415! Barasi Desert, *Riva*, 1435! Laferug, *James & Thrupp!* Ahl Mountains, 6500 ft., *Hildebrandt*, 8600! Serrut Mountains, near Maid, *Hildebrandt*, 1405! Milmil, *Donaldson Smith!* Harar, *Robecchi*, 4! Ogaden Steppe, *Keller*, 181!

“Sweet-scented: all over the hills,” *Mrs. Lort-Phillips*.

14. ***H. mlanjensis***, *C. B. Clarke*. Pubescent. Calyx $\frac{1}{4}$ in. long, minutely puberulous, white, rather firm; sepals united $\frac{2}{3}$ their length; otherwise as *H. Forskalei*.—*H. verticillaris*, *S. Moore* in Trans. Linn. Soc. ser. 2, Bot. iv. 34, partly.

Nile Land. British East Africa: Ukamba, *Gregory!*

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, 6000 ft., *Whyte*, 151!

15. ***H. verticillaris***, *R. Br. Prod.* 474, *in obs.* Stem and leaves hairy or nearly glabrous. Two outer connate bracts with few or many long white spreading hairs. Seeds 4 or 2 to the capsule; otherwise as *H. Forskalei*, *R. Br.*—*Nees* in Linnæa, xv. 376, and in DC. Prod. xi. 507; *T. Anders.* in Journ. Linn. Soc. vii. 48; *Balf. f.* in Trans. Roy. Soc. Edin. xxxi. 229; *S. Moore* in Trans. Linn. Soc. ser. 2, Bot. iv. 34, partly; *Lindau* in Engl. Jahrb. xviii. 63, t. 2, fig. 73, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333, fig. 134, A–C, and in Engl. Pfl. Ost-Afr. C. 371; *Rendle* in Journ. Bot. 1896, 411. *H. latifolia*, *Hochst.* ex *Nees* in DC. Prod. xi. 509; *Benth.* in Hook. Niger Fl. 484; *T. Anders.* in Journ. Linn. Soc. vii. 50; *Solms-Laub.* in Schweinf. Beitr. Fl. Aethiop. 111; *Lindau* in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333, and in Engl. Pfl. Ost-Afr. C. 371. *H. mollis*, *T. Anders.* in Journ. Linn. Soc. vii. 49; *S. Moore* in Journ. Bot. 1880, 363; *Lindau* in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333. *H. echioides*, *Lindau* in Engl. Jahrb. xx. 52, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333, and in Engl. Pfl. Ost-Afr. C. 371. *Justicia verticillaris*, *Linn. f. Suppl.* 85. *Dicliptera verticillaris*, *Juss.* in Ann. Mus. Paris, ix. (1807) 268.

Upper Guinea. Senegal, *Leprieur!* *Perrottet*, 621! Senegambia, *Heudelot*, 552! Sierra Leone, *Afzelius!* Togoland, *Alafanyo*, *Krause!* Ashanti, *Cummins*, 66! Lagos, *Millen*, 54! Cross River, *Johnston!* Cameroons: Rio del Rey, *Johnston!*

Nile Land. Kordofan, *Kotschy*, 296! 477! White Nile, *Schweinfurth*, 1058! 1066! Galabat: Matamma, *Schweinfurth*, 128! Somaliland, *Keller*, 182! 184! British East Africa: Toru, East of Ruwenzori, in Wimi Valley, 7000 ft., *Scott-Elliot*, 7880! 7899! Lykipia, *Thomson!* *Gregory!* Kapte Plateau, 5000–6000 ft., *Thomson!* Ukamba, *Hildebrandt*, 2715! *Scott-Elliot*, 6474! Tana River, *Donaldson Smith!* Nyika country near Mombasa, *Wakefield!*

Lower Guinea. Congo, *Smith!* Angola: Ambriz, *Monteiro!* Golungo Alto, *Welwitsch*, 5118! 5142! 5144!

South Central. Lunda: Lulua River, *Pogge*, 309!

Mozamb. Dist. German East Africa: Kilimanjaro, 3300 ft., *Volkens*, 1652, 1664!

Smith! Usambara; Umba Valley, *Smith!* Muoa, *Holst,* 2987! 3075! Masheua, *Holst,* 3492! 8858! Kwa Mshuza, *Holst,* 9148! Usaramo; Ukwere district, 160 ft., *Stuhlmann,* 8386! Ugalla River, *Boehm,* 279! Lower Plateau, north of Lake Nyasa, *Thomson!* Lake Tanganyika, *Cameron!* Kavala Island in Lake Tanganyika, *Carson!* Portuguese East Africa: Lower Zambesi: Lupata, *Kirk!* Lower Valley of the River Shire, *Meller!* British Central Africa: Urungu; Fwambo, *Carson,* 50! 93! *Nutt!* Nyasaland; between Mpata and Tanganyika Plateau, *Whyte!* Tanganyika Plateau at Fort Hill, *Whyte!* North Nyasa, *Whyte!* Nyika Plateau, 6000–7000 ft., *Whyte!* Kondowe to Karonga, 2000–6000 ft., *Whyte!* Mount Chiradzulu, *Meller,* 4000 ft., *Whyte!* Shire Highlands, *Buchanan,* 116! 465! Mount Mlanje, *Whyte!* Rhodesia: Leshumo Valley, *Holub,* 816!

Also in Arabia, Socotra and South Africa.

I have been unable to sort this species into varieties. The plants named by Lindau *H. latifolia*, Hochst. (*Holst,* 8858; *Volkens,* 1652) are identical with those named by him *H. verticillaris*, Solander (*Holst,* 3492, 9148), from the same locality: but they are not exactly *H. latifolia*, Hochst., which is founded on *Kotschy,* 296, and has ovate glabrous leaves 4 in. broad. *H. latifolia*, Nees, has leaves rather larger than usual (attaining 4 by $1\frac{2}{3}$ in.), but not differing in form from those of *H. verticillaris*. *H. mollis*, T. Anders., from the Congo, is remarkably like the typical Cape *H. verticillaris*. The most distinct form (included in the above list of numbers) is *Schweinfurth's* 128, collected in Gallabat (there are several examples like it from the Mozambique region), named by Schweinfurth & Lindau *H. latifolia*, from which it appears to differ considerably; the leaves are narrowly elliptic, much acuminate, the sepals are united scarcely $\frac{1}{3}$ their length, the 2 outer bracts are united scarcely $\frac{1}{3}$ their length, and with many spreading long white hairs. Nees says (in *Linnaea*, xv. 376) that this species "varies by having 4 didynamous stamens." I have never met with 4 stamens in any plant of the Justicioid series.

Var. β *glabra*, S. Moore in *Journ. Bot.* 1880, 363. Almost glabrous, except the inflorescence. Leaves attaining 1 by $\frac{1}{4}$ – $\frac{1}{3}$ in. Bracts pubescent, and also with some scattered white longer hairs.

Lower Guinea. Angola, *Welwitsch,* 5059!

S. Moore is probably right in regarding this as a depauperated state of *H. verticillaris*; but it is perhaps as well entitled to be made a species as any of the species which follow.

16. **H. Preussii**, Lindau in *Engl. Jahrb.* xx. 48. Leaves up to 5 by $1\frac{1}{2}$ in., elliptic, long acuminate, pubescent on the nerves and with scattered hairs, very shortly narrowed into the petiole; otherwise as *H. verticillaris*, R. Br.

Upper Guinea. Cameroons: Buea, 2500 ft., *Preuss,* 755!

This certainly does not match any of the numerous examples above referred to *H. verticillaris*, but it is difficult to say in what its specific difference exists. Lindau says the "bracteoles are adnate to the 2-toothed involucre" (which he states of some other species of *Hypoestes*). There is no union between the bracteoles and bracts; but, as in many *Acanthaceæ*, the bracteoles cling or stick somewhat to the bract which is external to them.

17. **H. violaceotincta**, Lindau in *Engl. Jahrb.* xxiv. 323. Inflorescences axillary and terminal, very compound paniced. Spikelets small; two outer bracts hardly exceeding $\frac{1}{4}$ in. in length; otherwise as *H. verticillaris*, R. Br.

Upper Guinea. Sierra Leone: Bafodeya, *Scott-Elliot!* Togoland: Misahöhe, *Baumann,* 476!

Leaves rather large. Bracts with some spreading white long hairs. The plant resembles much the large-leaved forms of the West African *H. verticillaris* (i.e. *H. latifolia*, β Nees). But *Holst*, 2265, from Usambara (marked *H. verticillaris* by Lindau) appears the same as *H. violaceotincta*.

18. **H. tanganyikensis**, *C. B. Clarke*. Inflorescences axillary and terminal, very laxly paniced; flowers mostly solitary (not clustered), $\frac{1}{4}$ – $\frac{1}{2}$ in. apart, white (*Whyte*). Two outer bracts to the spikelet $\frac{1}{2}$ by $\frac{1}{12}$ in., subequal, connate about $\frac{1}{3}$ their length, linear-oblong, subspathulate; otherwise nearly as *H. verticillaris*.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, 2000–3000 ft., *Whyte*! Nyika Plateau, 6000–7000 ft., *Whyte*, 192!

Imperfectly known species.

19. **H. grandifolia**, *Lindau in Engl. Jahrb.* xx. 49. Stem glabrous. Leaves up to $4\frac{1}{2}$ by $2\frac{1}{2}$ in., pubescent on the nerves beneath. Two outer bracts of the spikelet united $\frac{2}{3}$ their length, exceeding $\frac{1}{3}$ in. in length, hairy, enclosing 2 flowers.

Nile Land. Bongo, *Schweinfurth*, 2613.

The detailed description by Lindau fits very well many of the larger examples referred as forms to *H. verticillaris*, R. Br., as, for instance, to *Schweinfurth*, 1066, from the White Nile; but though in this 1066 there is a rudiment of the second flower in the spikelet, I find no 2-flowered spikelets.

The plant was not found at Berlin.

56. **RUNGIA**, Nees; Benth. et Hook. f. *Gen. Pl.* ii. 1120.

Corolla, stamens, pistil as of *Justicia*, sect. *Betonica*. Placentæ in ripe fruit rising elastically from the base of the capsule, throwing out the seeds.—Spikes strobilate; bracts in 4 ranks (whereof 2 alternate are sterile), much larger than the calyx, broad with prominently scarious margins.

Species 20, in the warmer parts of the Old World.

Bentham describes the inflorescence, "primarial bracts superposed in pairs, lower of each pair sterile, upper bearing a flower"; which is correct but he places the genus in his subtribe *Dicliptereæ*, to which he attributes "bracts 2 (or 4) valvately adpressed together, including one or several flowers." This definition applies to *Dicliptera*, *Peristrophe* and *Hypoestes*, but cannot be made to apply to *Rungia*, in which the inflorescence is as that of *Justicia*, sect. *Betonica* (or of *Adhatoda*), but with 2 ranks of bracts empty.

Bracts $\frac{3}{4}$ in. long	. . . . .	1. <i>R. grandis</i> .
Bracts $\frac{1}{4}$ in. long.		
Leaves acuminate, minutely pubescent	. . . . .	2. <i>R. paxiana</i> .
Leaves acuminate, glabrate	. . . . .	3. <i>R. Buettneri</i> .
Leaves obtuse, hispidulous	. . . . .	4. <i>R. congoensis</i> .

1. **R. grandis**, *T. Anders. in Journ. Linn. Soc.* vii. 46. Herbaceous up to 10 ft. high. Leaves 6 by $2\frac{1}{2}$ in., minutely pubescent on the midrib beneath, nearly glabrous; petiole $\frac{3}{4}$ in. long. Spikes terminal,

or terminating lateral branches, sometimes very short, up to 4 by 1 in.; bract up to $\frac{3}{4}$ by $\frac{1}{2}$ in., ovate, acute, green pubescent, with very broad shining white margins; or the bract sometimes orbicular, $\frac{3}{4}$ in. in diam., emarginate, owing to the great development of the scarious margin towards the top; bracteoles exceeding $\frac{1}{3}$ in. in length, boat-shaped, obtuse. Sepals $\frac{1}{3}$ in. long, nearly free, linear, pubescent. Corolla $\frac{3}{4}$ in. long, white (*Barter*); anticous lip ovate. Filaments glabrate; one anther-cell very slightly below the other, with a large clavate tail; pollen ellipsoid, with 3 bands and pores, and one row of smooth tubercles on each side of each stopple. Pistil and lower part of the style hairy; style-branches 2, subequal, very short. Capsule $\frac{1}{3}$ in. long, ovoid, subsessile, compressed, 4-seeded; placentæ rising elastically from the capsule-base; seeds cerebrose-tubercular.—*Justicia garckeana*, Büttn. in Verhandl. Bot. Ver. Brandenb. xxxii. (1890), 38.

Upper Guinea. Sierra Leone, Kofiu Mountain, *Scott-Elliot*, 4616! Sugarloaf Mountain, 2000 ft., *Scott-Elliot*, 3964! and without precise locality, *Afzelius*! *Winwood Reade*! Lagos: Otta Ifo, *Rowland*! Ikirun, *Millson*! Eppah on the Kradu Lagoon, *Barter*, 3274! and without precise locality, *Moloney*, 16! *Millen*, 59! Cameroons: Yaunde, *Zenker & Staudt*, 172!

Lower Guinea. Congo, *Smith*! Angola: Quidando River, *Marques*, 336! Kuango River, *Büttner*, 356!

2. **R. paxiana**, *C. B. Clarke*. Herbaceous, up to 5 ft. high. Leaves, up to 5 by $1\frac{1}{2}$ in., broad-lanceolate, acuminate at either end, somewhat hispidulous; petiole $\frac{2}{3}$ in. long. Spikes terminal and quasi-axillary, $1\frac{1}{4}$ by $\frac{1}{2}$ in.; bracts $\frac{1}{4}$ in. long, or rather more, orbicular, with a few long white hairs, and broad white margins; bracteoles nearly linear. Corolla hardly $\frac{1}{2}$ in. long, pale purple (*G. Mann*). One anther-cell clearly lower than the other, not tailed; pollen as of *R. grandis*. Capsule $\frac{1}{4}$ in. long, nearly glabrous, except the tip, sometimes 4-seeded; placentæ rising elastically from the base; seeds papillose, hardly tubercled.—*R. pubescens*, T. Anders. MS. *Justicia paxiana*, Lindau in Engl. Jahrb. xx. 63, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 350.

Lower Guinea. Cameroons: Buea, 3500 ft., *Preuss*, 956! Cameroon Mountain, 3000–4000 ft., *Mann*, 1968! Fernando Po, 3000 ft., *Mann*, 588!

Lindau has redistributed the species of *Rungia*, *Justicia*, *Himantochilus*, &c., by the pollen; the Diclipteroid group have "Spangen (banded) pollen," the Justicioid have "Knötchen (tubercled) pollen." He attributes to *Rungia* "placentæ arising elastically from capsule-base," while nothing is said under the genus *Justicia* regarding this character. Under this system, *Rungia pubescens*, T. Anders., appears as *Justicia paxiana*, Lindau; *Rungia grandis*, T. Anders., is returned to Kew from Berlin marked *Justicia grandis* (T. Anders.), Lindau; *Rungia* (?) *pubinervia*, T. Anders., is published as *Himantochilus marginatus*, Lindau. Per contra, *Justicia tenella*, T. Anders., is called *Rungia Baumannii*, Lindau. The "banded" pollen appears to me separable by no definite line from the tubercled pollen; the smooth bands (in the centre of which are the pores) have often "obsolete" rows of marks or dots which (in adjacent species) are slightly stronger and reckoned as tubercles. If *Rungia grandis* and *R. pubescens*, T. Anders., are transferred to *Justicia*, the genus *Rungia* must be abandoned altogether.

3. **R. Buettneri**, *Lindau in Engl. Jahrb.* xx. 46. Leaves 4 by $1\frac{1}{3}$ in., narrowed at both ends, upper surface puberulous, finally glabrate;

petiole 1 in. long. Spikes terminal and quasi-axillary, unilateral; bracts nearly $\frac{1}{3}$ in. long, ovate, hyaline-edged, apiculate or long-cuspidate. Calyx $\frac{1}{4}$ in. long, unequally 5-fid, hairy. Corolla $\frac{1}{4}$ in. long. One anther-cell lower than the other, tailed; pollen "banded" and also minutely tubercled. Capsule small, puberulous; dissepiments separating; seeds tubercled.—Lindau in Engl. & Prantl, Pflanzenfam. iv. 3 B. 332.

Upper Guinea. Cameroons: Yaunde, *Zenker & Staudt*, 189!

South Central. Congo Free State: in thickets by the River Ganga, near the town of Muene Putu Kasongo, *Büttner*, 456!

Not in "Gaboon-Loango," as stated by Lindau; see Proc. Royal Geograph. Soc. 1886, p. 635.

4. **R. congoensis**, *C. B. Clarke*. Branches 1 foot long, minutely pubescent. Leaves 3 by 1 in., obtuse, glabrate, base attenuate; petiole $\frac{1}{2}$ in. long. Spikes terminal and many quasi-axillary, up to $1\frac{1}{2}$ by nearly $\frac{1}{2}$ in.; bract orbicular, $\frac{1}{4}$ in. in diam., minutely pubescent, with a broad hyaline margin. Sepals 5, subequal, $\frac{1}{10}$ in. long, linear. Corolla small, hardly exceeding $\frac{1}{4}$ in. in length (not seen well expanded). Capsule $\frac{1}{6}$ – $\frac{1}{5}$ in. long; placentæ rising elastically from the base of the valves; seeds minutely tuberculate.

Lower Guinea. Lower Congo: Lukungu, 700 ft., *Hens*, 330! *Smith*, 64!

This has been supposed possibly to be *Rungia repens*, Nees, a common weed in India; but the seeds differ, and the numerous axillary spikes give it a different aspect.

57. MACRORUNGIA, C. B. Clarke.

Sepals 5, united half-way up, or nearly free, coloured, scarious, free portions broad-lanceolate. Corolla red; tube scarcely $\frac{1}{3}$ in. long; anticous lip 1 in. or more, without in the bud, sub-3-fid or subentire; posticous lip broader, emarginate. Stamens 2; filaments long exerted, glabrous; anther-cells 2, oblong, muticous, one placed a little below the other; pollen ellipsoid, with 2 stopples and several rows of minute tubercles, obscurely banded. Capsule ovoid; placentæ rising elastically from the base of the valves; seeds obscurely cerebrose-marked.—Shrubs, nearly glabrous. Leaves entire. Flowers in spikes; bract ovate, narrowly hyaline-edged; bracteoles 0, or narrow.

Species, besides the subjoined, 1 in South Africa.

From the fruit, *Macrorungia* must stand next *Rungia* or be sunk in it. The corolla is very unlike that of *Rungia*, as is the comparatively large tubular hyaline calyx. The spikes are looser than in *Rungia*, less strobilate, the bracts not (or most obscurely) 4-ranked, some of them (not those in one definite rank) empty.

The distinction between *Anisotes* and *Macrorungia* lies in the elastic rising of the placentæ in the ripe capsule in *Macrorungia*. Lindau has placed his *Symplectochilus*

next *Duvernoia*, i.e., *Adhatoda*, but I rather guess from the inflorescence that the fruit (which I have not seen) will prove to be that of *Macrorungia*.

Leaves 6 in. long, when young densely pubescent

beneath

Leaves up to 12 in. long, glabrous

Leaves less than 2 in. long, nearly glabrate

1. *M. pubinervia*.

2. *M. macrophylla*.

3. *M. formosissima*.

1. ***M. pubinervia***, *C. B. Clarke*. Leaves 6 by $2\frac{1}{2}$ in., narrowed at both ends, when young densely grey pubescent on the nerves beneath, finally glabrate; petiole 1 in. long. Spikes all axillary, short-peduncled, 3-8-flowered, $\frac{1}{2}$ - $1\frac{1}{4}$ in. long, lax, hardly strobilate; bract $\frac{1}{4}$ - $\frac{1}{3}$ in. long, ovate or obovate. Calyx $\frac{1}{3}$ in. long, tubular for $\frac{1}{2}$ its length, minutely pubescent, pinkish. Corolla $1\frac{1}{3}$ in. long, red-purple. Pistil glabrous; stigma minutely 2-fid. Capsule $\frac{1}{3}$ - $\frac{1}{2}$ in. long.—*Rungia* (?) *pubinervia*, T. Anders. in Journ. Linn. Soc. vii. 46. *Himantochilus marginatus*, Lindau in Engl. Jahrb. xx. 60, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 346. *H. pubinervius*, Lindau in Engl. Pfl. Ost-Afr. C. 373.

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, *Holst*, 9063! British Central Africa: Nyasaland; Mount Chiradzulu, *Kirk*! 4000 ft., *Whyte*!

2. ***M. macrophylla***, *C. B. Clarke*. Leaves up to 12 by 5 in., narrowed at both ends, glabrous; petiole 1-2 in. long. Inflorescences axillary, short, dense, peduncled; bracts $\frac{3}{5}$ by $\frac{1}{2}$ in., ovate, acuminate, imbricate. Calyx $\frac{1}{4}$ in. long, tubular at the base; teeth $\frac{1}{6}$ in. long, lanceolate, finely hairy. Corolla-tube $\frac{2}{3}$ in. long; upper lip $1\frac{1}{3}$ in. long. Stamens and pistil of the genus.—*Himantochilus macrophyllus*, Lindau in Engl. Jahrb. xx. 60, in Engl. & Prantl, Pflanzenfam. iv. 3 B. 346. and in Engl. Pfl. Ost-Afr. C. 372.

South Central. Congo Free State: in Forest west of the Isango or Semliki River, *Stuhlman*, 2938!

3. ***M. (?) formosissima***, *C. B. Clarke*. Leaves $1\frac{1}{2}$ by $\frac{3}{4}$ in., elliptic, nearly glabrate; petiole $\frac{1}{3}$ in. long. Spikes on short axillary branches, $1\frac{1}{2}$ - $2\frac{1}{2}$ by $\frac{1}{2}$ in., loosely strobilate; bract $\frac{1}{2}$ by $\frac{1}{3}$ in., elliptic, acute, strongly 5-ribbed, and puberulous; bracteoles $\frac{1}{3}$ in. long, linear. Calyx subequally and deeply 5-fid; segments $\frac{1}{4}$ in. long, narrow-lanceolate, pubescent. Corolla nearly 2 in. long, narrow, red; anticous lip more than 1 in. long, linear. Stamens 2; filaments long, glabrous; one anther-cell much below the other, shortly tailed; pollen ellipsoid, smooth, with 2 stopples, completely banded. Pistil glabrous, except for a few hairs near the base of the style; style shortly and subequally 2-fid; ovules 2 in each cell.—*Adhatoda formosissima*, Klotzsch in Peters, Reise Mossamb. Bot. 215. *Symplectochilus formosissimus*, Lindau in Engl. Jahrb. xx. 45, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 339, fig. 107, F, and 135, H, and in Engl. Pfl. Ost-Afr. C. 372.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi: Sena, *Peters*! Tete, *Kirk*! British Central Africa: Nyasaland, *Buchanan*, 1407!

58. **DICLIPTERA**, Juss. ; Benth. et Hook. f. Gen. Pl. ii. 1120.

Sepals 5, equal, small, linear, pubescent, hardly united at the base. Corolla rose-purple to white, deeply 2-lipped; tube not or slightly inflated; anticus lip 3-fid, without in the bud; posticus lip entire or emarginate. Stamens 2; anther-cells 2, one above the other, muticous; pollen ellipsoid, smooth, with 3 (or 2) bands and stopples. Ovules 2 in each cell; style with 2 subequal very short lobes. Capsule small, ovoid, sessile or very shortly compressed, 4- or 2-seeded; placentæ arising elastically from the base of the capsule-valves; seeds discoid, dotted with glochidiate tubercles, sometimes elongate, sometimes shortened to warts or obsolete.—Herbs. Leaves entire. Spikelets 2-1- (rarely 3-) flowered, in heads or scattered; bracts to the two flowers subopposite, enclosing the calyx, from linear to ovate; bracteoles 2 to each flower, lanceolate, shorter than the bract, longer than the calyx.

Species 60; in the tropical and subtropical regions of both hemispheres.

This genus is grounded on the elastically rising placentæ; and in much of the material without ripe capsules, the plants are put in *Dicliptera* by inference. When Bentham (in Benth. et Hook. f. Gen. Pl. ii. 1121) states the bracts and sepals to be sometimes united, it must be recollected that many of the specimens which passed through his hands as *Dicliptera* were really *Hypoestes*, in which genus the structure of the spikelet is exactly as that of *Dicliptera*.

*Bracts to the spikelet linear or narrow-lanceolate, not widened upwards.

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|--|--------------------------|
| Branches with prickles on the angles | 1. <i>D. aculeata</i> . |
| Branches without prickles, hairy | 2. <i>D. Carvalhoi</i> . |
| Branches without prickles, glabrous | 3. <i>D. lingulata</i> . |

**Bracts to the spikelet wider, ovate or obovate or obovate-lanceolate.

Spikelets solitary or laxly approximated.

- | | |
|---|--------------------------|
| Axillary peduncles long; pedicels mostly long | 4. <i>D. maculata</i> . |
| Cymes short, forming axillary clusters | 5. <i>D. laxata</i> . |
| Spikelets alternate on a zigzag spike | 6. <i>D. alternans</i> . |

Spikelets densely clustered in ovoid heads.

Bracts to the spikelet broad, ovate or round obovate.

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| Corolla exceeding 1 in. in length | 7. <i>D. mossambicensis</i> . |
| Corolla about $\frac{1}{2}$ in. long | 8. <i>D. Elliotii</i> . |

Bracts to the spikelet oblong or lanceolate, wider at the top.

Heads of spikelets many axillary.

Bracts of spikelets green, hairy.

Leaves narrowed at the base.

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|---|-----------------------------|
| Heads of spikelets very dense | 9. <i>D. micranthes</i> . |
| Heads of spikelets loose | 10. <i>D. umbellata</i> . |
| Leaves cordate | 11. <i>D. Welwitschii</i> . |
| Bracts glabrescent | 12. <i>D. angolensis</i> . |
| Bracts brown, more or less purplish | 13. <i>D. colorata</i> . |
| Bracts whitish, green-nerved | 14. <i>D. Leonotis</i> . |

Heads of spikelets mostly peduncled, appearing terminal.

- | | |
|--|--------------------------|
| Leaves elliptic; heads small | 15. <i>D. nilotica</i> . |
| Leaves narrow-oblong; heads in an oblong spike | 16. <i>D. Melleri</i> . |

1. **D. aculeata**, *C. B. Clarke*. Stems hispid, prickly on the angles. Leaves (upper only seen) 2 by $\frac{1}{2}$ in., oblong, acute, scabrous or nearly glabrate, base obtuse; petiole short. Heads ovoid, of 2–12 spikelets, terminal and on short axillary peduncles, sparsely and minutely hispid. Lower bract to the spikelet up to $\frac{3}{4}$ by $\frac{1}{12}$ in., linear-lanceolate, long mucronate, nearly glabrous. Calyx $\frac{1}{4}$ in. long. Corolla $\frac{2}{3}$ in. long. Filaments hairy; one anther-cell completely over the other; stopples of pollen very large. Pistil glabrous.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 4000–7000 ft., *Whyte!* Fort Hill, 4300–4600 ft., *Whyte!*

2. **D. Carvalhoi**, *Lindau in Engl. Pfl. Ost-Afr. C.* 371. Branches hairy or pubescent on the angles. Leaves up to $3\frac{1}{2}$ by $\frac{1}{2}$ in., acute at both ends, softly hairy or glabrate; petiole $\frac{1}{2}$ in. long. Spikelets in clusters, running into quasi-terminal oblong spikes; two bracts to the spikelet narrow, unequal, lower $\frac{2}{3}$ by $\frac{1}{12}$ in., linear with parallel sides, suddenly narrowed into a linear mucro; upper bract much shorter. Corolla slender. Capsule of *Dicliptera*.—*Lindau in Engl. Jahrb.* xxiv. 323.

Mozamb. Dist. Portuguese East Africa: between the lower and middle Zambesi, *Carvalho!* British Central Africa: Nyasaland; between Mpata and Tanganyika Plateau, 2000–3000 ft., *Whyte!* Tanganyika Plateau at Fort Hill, *Whyte!*

3. **D. lingulata**, *C. B. Clarke*. Branches glabrate. Leaves $2\frac{1}{2}$ by 1 in., elliptic-lanceolate, base cuneate, glabrate; petiole $\frac{1}{4}$ – $\frac{3}{4}$ in. long. Spikelets rather closely paniced towards the tips of the branches; two bracts $\frac{1}{3}$ – $\frac{1}{2}$ by $\frac{1}{16}$ – $\frac{1}{12}$ in., linear-lanceolate, with green points, minutely thinly hispid. Calyx $\frac{1}{5}$ in. long, minutely hairy. Corolla hardly exceeding $\frac{1}{2}$ in. in length. Filaments very sparsely hairy; one anther-cell completely over the other.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte, 192A!*

4. **D. maculata**, *Nees in DC. Prod.* xi. 485, *excl. var. β*. Stem 2–3 ft. long, glabrous or hairy (in adjacent internodes). Leaves $3\frac{1}{2}$ by $1\frac{1}{4}$ in., ovate-lanceolate, cuneate at the base, glabrous or sparsely minutely hairy; petiole often 1 in. long. Peduncles axillary and terminal, often 1–3 in. long; pedicels many, $\frac{1}{4}$ – $\frac{3}{4}$ in. long, outer bract to the spikelet $\frac{1}{2}$ – $\frac{1}{6}$ in. long, elliptic, obtuse, pubescent, some long white hairs sometimes added. Calyx $\frac{1}{6}$ in. long, minutely pubescent. Corolla $\frac{2}{3}$ – $\frac{3}{4}$ in. long. Filaments nearly glabrous; one anther-cell completely above the other.—*A. Rich. Tent. Fl. Abyss.* ii. 159; *Engl. Hochgebirgsfl. Trop. Afr.* 394; *T. Anders. in Journ. Linn. Soc.* vii. 47; *Lindau in Engl. & Prantl, Pflanzenfam.* iv. 3 B. 333. *Justicia bivalvis*, *R. Br. in Salt, Abyss. Append.* 62 (?) *Peristrophe maculata*, *Hochst. ex Nees in DC. Prod.* xi. 485.

Nile Land. Ethiopia, *Kotschy, 476!* Abyssinia, *Jelajerranne, Schimper, 701!* Adowa, *Petit, 491!* and without precise locality, *Plowden! Schimper, 1438!*

5. **D. laxata**, *C. B. Clarke*. Branches angular, nearly glabrous. Leaves $3\frac{1}{4}$ by $1\frac{1}{4}$ in., triangular-acute at either end, nearly glabrous; petiole often 1 in. long. Cymes axillary, $\frac{3}{4}$ in. in diam.; spikelets nearly all manifestly pedicelled; outer bract $\frac{1}{3}$ – $\frac{1}{2}$ by $\frac{1}{6}$ in., elliptic-acute, nearly glabrous. Calyx $\frac{1}{8}$ in. long. Capsule $\frac{1}{6}$ in. long, hairy; placentæ rising elastically; seeds tubercled.

Nile Land. British East Africa: Kavirondo; Samia, *Scott-Elliott*, 7098!

Mozamb. Dist. British Central Africa: Nyasaland; Masuka Plateau, 6500–7000 ft., *Whyte*!

6. **D. alternans**, *Lindau in Engl. Jahrb.* xx. 47. Stem weak, sparingly hairy. Leaves $2\frac{1}{4}$ by 1 in., elliptic, suddenly narrowed at either end, nearly glabrous; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Spike terminal; spikelets alternate, solitary, $\frac{1}{12}$ – $\frac{1}{8}$ in. apart, in the axil of one of two opposite unequal minute floral leaves; two bracts to the spikelet subequal, $\frac{1}{4}$ by $\frac{1}{10}$ in., elliptic, subobtusely, green-veined, nearly glabrous. Corolla nearly $\frac{1}{2}$ in. long. Capsule $\frac{1}{6}$ in. long, somewhat pubescent; placentæ rising elastically from the base of the capsule.

Upper Guinea. Cameroons: Buea, *Preuss*, 604!

7. **D. mossambicensis**, *Klotzsch in Peters, Reise Mossamb. Bot.* 220. Stems 2–3 ft. long, 4-angular, white on the angles, glabrous or shaggy white-hairy. Leaves 1 by $\frac{1}{3}$ in. (*Klotzsch*). Heads of spikelets rather dense, subglobose, axillary and terminal. Two bracts of the spikelet $\frac{1}{3}$ – $\frac{1}{2}$ by $\frac{1}{4}$ – $\frac{1}{3}$ in., ovate, acute, mucronate, hairy, sometimes one of the two much larger. Sepals 5, $\frac{1}{6}$ in. long, hairy. Corolla $\frac{2}{3}$ in. long. Stamens 2; anther-cells 2, one completely over the other. Capsule $\frac{1}{5}$ in. long, hairy on the margin; placentæ rising elastically from the base of the capsule-valves.—*Lindau in Engl. Pfl. Ost-Afr. C.* 371.

Mozamb. Dist. German East Africa: Rovuma River, *Kirk*! Portuguese East Africa: Mozambique, *Klotzsch*! Lower Zambesi; Shupanga, *Stewart*! Lower Shire Valley; Makanga Mountain, *Scott*!

None of the examples seen have any leaves.

8. **D. Elliotii**, *C. B. Clarke*. Stems 6–8 in. long, glabrate. Leaves $1\frac{1}{2}$ by $\frac{2}{3}$ in., ovate, acuminate at either end, nearly glabrous; petiole $\frac{1}{3}$ in. long. Heads of spikelets rather dense, subglobose, axillary and terminal. Two bracts of the spikelet $\frac{1}{4}$ in. long and broad, round-obovate, hairy, shortly white ciliate on the margin. Corolla about $\frac{1}{2}$ in. in total length. Capsule $\frac{1}{6}$ in. long, hairy on the margin; placentæ rising elastically from the base of the capsule-valves.

Upper Guinea. Sierra Leone: shady places by the Scarcies River, at Wallia, *Scott-Elliott*, 4632!

Lower Guinea. Congo, *Smith*, 8! 64!

9. **D. micranthes**, *Nees in Wall. Pl. As. Rar.* iii. 112. Stems 1–2 ft. long, 6-angular, angles whitened, glabrous or sparsely hairy upwards. Leaves 3 by $1\frac{1}{4}$ in., elliptic, narrowed at both ends, glabrous

or nearly so; petiole $1-1\frac{1}{2}$ in. long. Spikelets in dense globose heads $\frac{1}{2}-\frac{3}{4}$ in. diam., terminal and many axillary, extending often to the lower axils. Two bracts of the spikelet $\frac{1}{4}-\frac{1}{3}$ in. long, obovate-lanceolate, suddenly narrowed into a spinescent mucro, green, minutely hairy, with much or little (usually with much) long white spreading hair added; bracteoles rather shorter than the bract, linear. Sepals 5, $\frac{1}{8}-\frac{1}{6}$ in. long, linear, hairy. Corolla $\frac{1}{3}-\frac{1}{2}$ in. long. Capsule $\frac{1}{6}$ in. long, sparingly hairy; seeds (often 4) tubercled.—Nees in DC. Prod. xi. 484; A. Rich. Tent. Fl. Abyss. ii. 159; T. Anders. in Journ. Linn. Soc. vii. 47; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 553; Lindau in Engl. & Prantl, Pflanzenfam. iv. B. 333, fig. 134, D-G; Zarb, Cat. Spéc. Bot. Pfund, 32. *D. spinulosa*, Hochst. ex Nees in DC. Prod. xi. 484.

Upper Guinea. Senegal, *Roger*, 42!

Nile Land. Upper Sennar; Fazokl, *Kotschy*, 513! Darfur, *Purdy*, 70! 87! Kordofan, *Kotschy*, 277! *Pfund*, 421! 437, 439! Abyssinia: Jelajeranne, *Schimper*, 509! and without precise locality, *Schimper*, 806!

Mozamb. Dist. German East Africa: *Fischer*, 480! British Central Africa: Lake Nyasa; Lukoma (Likoma Island?), *Bellingham*!

Also found in India.

10. ***D. umbellata***, *Juss.* in *Ann. Mus. Par.* ix. (1807) 268. Heads lax, running into terminal spikes. Two bracts of the spikelet longer, more unequal, lower often $\frac{1}{3}-\frac{1}{2}$ in. long; otherwise nearly as *D. micranthes*.—*Benth.* in Hook. Niger Fl. 484; Nees in DC. Prod. xi. 484. *D. maculata*, var. *senegambica*, Nees in DC. Prod. xi. 485. *D. usambarica*, Lindau in Engl. Jahrb. xx. 47, and in Engl. & Prantl, Pflanzenfam. iv. 3 B. 333, and in Engl. Pfl. Ost-Afr. C. 371. *D. verticillaris*, T. Anders. in Journ. Linn. Soc. vii. 47; S. Moore in Journ. Bot. 1880, 362, not of *Juss.* *Justicia umbellata*, Vahl, Enum. i. 111.

Upper Guinea. Senegambia: Brava Island, *Brunner*! Sierra Leone: *Smeathman*! *Afzelius*! Lagos, *Barter*, 20176! Cameroons: Yaunde, *Zenker*, 642!

Lower Guinea. Congo: Jeyanga and Mpoka, *Burton*! and without precise locality, *Smith*! Angola: Mossamedes, *Welwitsch*, 4999! 5133! 5166!

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, 5000 ft., *Holst*, 8914A! Uluguru, *Stuhlmann*, 9170! British Central Africa: Nyasaland; between Songwe River and Karonga, 1700-2000 ft., *Whyte*, 28!

It may be doubted whether this is more than a wet-country form of *D. micranthes*. It is greener, less woolly, and rather larger in all its parts.

11. ***D. Welwitschii***, *S. Moore* in Journ. Bot. 1880, 362. Branches 6-angular, minutely pubescent. Leaves $2\frac{1}{4}$ by $1\frac{1}{3}$ in., cordate-ovate, acute, sparsely and minutely hispid; petiole $\frac{1}{5}$ in. long; lower leaves 5 in. long, ovate, acute at both ends in *Pogge*, 4218. Heads terminal and many axillary, ovoid, $\frac{3}{4}-1$ in. in diam. Two bracts $\frac{3}{4}$ in. long, broad-lanceolate, acute, hispid. Calyx $\frac{1}{3}$ in. long. Corolla 1 in. long. Filaments glabrous; one anther-cell completely over the other.

Lower Guinea. Angola: Huilla, *Welwitsch*, 5015!

South Central. Lunda: Lomani River, *Pogge*, 4218!

Allied to *D. umbellata*, *Juss.*, but larger.

12. **D. angolensis**, *S. Moore in Journ. Bot.* 1880, 362. Stem 6-angular, glabrous or in places hispid. Leaves $1\frac{1}{3}$ by $\frac{3}{4}$ in., ovate-lanceolate, minutely hispid or glabrate; petiole $\frac{1}{4}$ in. long. Heads terminal and axillary, ovoid $\frac{3}{4}$ -1 in. diam. Two bracts of the spikelet $\frac{2}{3}$ in. long, obovate-lanceolate, apiculate, slightly pubescent or nearly glabrate (margins thinly ciliate), somewhat coriaceous. Calyx $\frac{1}{4}$ in. long. Corolla $\frac{3}{4}$ in. long. Filaments glabrous; one anther-cell completely above the other.

Lower Guinea. Angola: Golungo Alto and Bumba, 3000-7500 ft., *Welwitsch*, 5116, 5132! 5168! Huilla, *Antunes*, 142, 179!

This is very close to *D. umbellata*, Juss.; but the heads are much less hairy than in any example of that species.

13. **D. colorata**, *C. B. Clarke*. Angles of branches 6, patently hispid. Leaves up to 2 by $1\frac{1}{4}$ in., ovate, acute, sparsely hispid, base rounded or sometimes subcordate; petiole $\frac{1}{4}$ in. long. Heads terminal and many axillary, ovoid, $\frac{3}{4}$ -1 in. in diam. Two bracts of the spikelet $\frac{1}{2}$ by $\frac{1}{8}$ in., lanceolate, mucronate, dark-brown or purplish-brown (even before the expansion of the corolla), with spreading white hairs. Corolla $\frac{3}{4}$ in. long. Filaments hairy; one anther-cell completely over the other. Pistil glabrous but for a few scattered hairs on the style.

Nile Land. British East Africa: Raomi River, 7000 ft., *Scott-Elliott*, 6766!

Mozamb. Dist. British Central Africa: Nyasaland: Nyika Plateau, 6000-7000 ft., *Whyte*!

The brown or purple-brown bracts give this plant a marked look, but it is very near *D. umbellata*.

14. **D. Leonotis**, *Dalz. ex C. B. Clarke in Hook. f. Fl. Brit. Ind.* iv. 553. Stems 6-8-angular, pubescent. Leaves up to 3 by 1 in., elliptic lanceolate, pubescent. Heads globose, dense, axillary and approximated towards the ends of the branches. Two bracts of the spikelet $\frac{1}{3}$ - $\frac{1}{2}$ by $\frac{1}{12}$ - $\frac{1}{10}$ in., lanceolate, 3-nerved, pubescent. Corolla exceeding $\frac{3}{4}$ in. in length. Filaments glabrous; one anther-cell completely above the other.

Mozamb. Dist. British Central Africa: Nyasaland: Blantyre, very plentiful on the banks of streams and in shady places, *Buchanan*, 127! near Sekwere Village, *Kirk*! and without precise locality, *Buchanan*, 568!

Also in India.

In the Nyasaland examples, the plants are rather stronger, the leaves more hairy, the heads larger than in the Bombay examples; but the differences hardly suffice to characterise a geographic form.

15. **D. nilotica**, *C. B. Clarke*. Plants 4-8 in. long; branches angular, pubescent. Leaves up to 2 by $\frac{2}{3}$ in., elliptic-oblong, hardly acute, minutely hairy; petiole $\frac{1}{8}$ in. long. Heads dense, small (hardly $\frac{1}{2}$ in. in diam.), terminal, or the axillary heads mostly peduncled (terminal or shortened lateral branches); floral leaves linear-oblong. Two bracts of the spikelet $\frac{1}{4}$ - $\frac{1}{3}$ in. long, narrowly obovate-oblong, hairy. Calyx hardly $\frac{1}{8}$ in. long. Corolla $\frac{3}{4}$ in. long; lips unusually broad.

Filaments glabrous, one anther-cell completely above the other.—*D. bupleuroides*, T. Thoms. in Speke, Nile, Append. 644. *Dicliptera*, sp. near *D. bupleuroides*, Oliv. in Trans. Linn. Soc. xxix. 130. *D. kamerunensis*, Lindau in Engl. Jahrb. xxii. 121 (?).

Nile Land. British East Africa: Madi, *Grant!* Moru district, at Wayo, *Petherick!*

Lindau's *D. kamerunensis* is *Passarge*, 128, from the Cameroons. The species of the present group are all of them near *D. bupleuroides*, and *D. roxburghiana*, Nees; but why Dr. Thomson and Prof. Oliver thought the present plant specially near *D. bupleuroides* is not so clear; the heads have not the axillary character seen in *D. bupleuroides*; the reduced narrow upper leaves make the inflorescence appear like heads in a terminal panicle.

16. **D. Melleri**, *Rolfe in Oates, Matabeleland*, ed. 2, 405. Branches pubescent, finally glabrate. Leaves $1\frac{3}{4}$ by $\frac{1}{4}$ in., narrowed at both ends, glabrate; petiole $0-\frac{1}{8}$ in. long. Heads of flowers nearly all approximated into a terminal oblong compound spike, up to 3 by $\frac{1}{3}$ in. Lower bract to spikelet $\frac{1}{3}$ by $\frac{1}{12}-\frac{1}{8}$ in., lanceolate or obovate-lanceolate, with spreading white hairs; bract to upper flower similar but shorter. Calyx $\frac{1}{5}$ in. long. Corolla $\frac{2}{3}$ in. long. Filaments glabrous, minutely hairy in the lower part; one anther-cell completely above the other. Capsule $\frac{1}{4}$ in. long, hispid at the top, ovoid, flattened, 2-seeded; placentæ rising elastically from the base of the valves. Seeds papillose, hardly tubercled.

Mozamb. Dist. British Central Africa: Nyasaland: between Blantyre and Matope, 2500 ft., *Scott!* Mount Chiradzulu, *Meller!* and without precise locality, *Buchanan!* Matabeleland, *Oates!*

Imperfectly known species.

17. **Duvernoia Descampsii**, *Dewèvre in Comptes-rendus Soc. Bot. Belg.* xxxiii. (1895), 104 (*name only*).

Mozamb. Dist. British Central Africa: Nyasaland; Karonga, *Descamps!*

There are authentic flowers of this in the Berlin Herbarium, whence it is seen to be a *Dicliptera*, with narrow-lanceolate bracts to the spikelet.

Of doubtful position.

59. **HIERNIA**, S. Moore in Journ. Bot. 1880, 196.

Calyx tubular-campanulate, with 5 long narrow teeth. Corolla-tube somewhat curved, widening very gradually upwards; lobes spreading, ovate, very obtuse, imbricate in the bud, one lobe entirely within, the two posterior somewhat united. Stamens 4, inserted on the corolla-tube, didynamous; anthers composed of one anther-lobe, in the bud folded upon the filaments, lying inside and parallel to them, acute at the free end and dehiscing by a short slit, which commences at the free end and extends towards the middle; the second anther-lobe represented by a minute wart at the apex of the filament. Pollen smooth, sub-globose. Ovary with two unequal cells, each with 6-10 ovules in two rows. Capsules markedly oblique, flattened laterally, and grooved down

each side, somewhat acute above. Seeds each on the apex of a somewhat elongated funicle; funicle a little enlarged above, but not developed into a true retinaculum.—A shrub with rigid branches, arising regularly in pairs at each node, viscid-pubescent. Leaves narrow, sessile, scabrid. Flowers solitary in the axils, shortly pedunculate, ebracteolate.

Endemic.

1. **H. angolensis**, *S. Moore in Journ. Bot.* 1880, 197, t. 211. A spreading shrub. Branches rigid, somewhat rectangular, pubescent. Leaves sessile, lanceolate, rather obtuse, scabrid on both surfaces, $2\frac{1}{2}$ –14 lin. long, $\frac{3}{4}$ –3 lin. broad, the midrib alone prominent. Calyx 4 lin. long, with conspicuous puberulous veins. Corolla-tube 5–6 lin. long. Capsule 4 lin. long.—Lindau in *Engl. & Prantl, Pflanzenfam.* iv. 3 B. 288.

Lower Guinea. Angola, in woods near Quitive de Cima, *Welwitsch*, 5001! Damaraland, *Een!* Amboland, South-east Andonga, *Schinz*, 18!

There is much doubt about the position of this plant. The mode of branching and the leaves are as in *Hygrophila pilosa*, Burkill, but there are characters in the ovary and in its shrubby nature which remove it; the ovary is more like that of *Nelsonia*, but the calyx, habit, and other characters are very unlike; the stamens again are very different from those of the first tribes of the *Acanthaceæ*, and suggest a relationship to *Blepharis*, which can in no way be considered as close. On the other hand, the habit is that of *Radamea* in *Scrophulariaceæ*, and the stamens are like those of some plants of its affinity; and, finally, the oblique capsule is like that of a *Pedicularis* or a *Melampyrum* and separates the genus so much from *Acanthaceæ* that at first we were inclined to place it unhesitatingly in *Scrophulariaceæ*. The pollen is characterless, and in this like that of *Scrophulariaceæ*.

Spencer Moore places *Hiernia* between *Nelsonia* and *Hygrophila*; Lindau places it near *Nelsonia*; while doubting if it really belongs to *Acanthaceæ*, we consider that at least it ought to be placed in a tribe separate from the other plants of this Order.

ORDER XCIX. MYOPORINEÆ (by R. A. Rolfe).

Flowers hermaphrodite, irregular or nearly regular. Calyx inferior, 5-partite or 5-lobed. Corolla gamopetalous; tube short and somewhat campanulate, or elongate and infundibular; limb subequal, oblique or bilabiate, 5-, or rarely 6-, lobed; lobes imbricate, the two posticous often exterior, sometimes deeply connate. Stamens 4, didynamous or subequal, rarely as numerous as the corolla-lobes, inserted on the corolla and alternating with its lobes, included or exserted; filaments filiform or thickened at the base; anthers normally 2-celled; cells at first parallel, afterwards often diverging from the confluent apex, dehiscent longitudinally. Disc hypogynous, small or nearly obsolete. Ovary superior, normally 2-celled, but often spuriously many-celled by the intrusion of septa between the ovules, or truly many-celled. Ovules 2, collateral, or 4–8 in superposed pairs, or solitary when the ovary is many-celled; anatropous, with a superior micropyle; style simple, terminal, short or somewhat elongated, filiform; stigma terminal, small, entire or obscurely emarginate, rarely oblique. Fruit drupaceous, indehis-

cent; exocarp fleshy, succulent or rarely dry; endocarp hard or thin, 2-celled or the cells as numerous as the seeds, rarely breaking up into pyrenes. Seeds 2–10, usually solitary, in cells arranged in one series round the axis, very rarely superposed (the upper ovules being generally abortive), pendulous, oblong; testa membranous or somewhat thickened; albumen fleshy, slender, or nearly absent. Embryo straight or slightly curved; radicle terete, superior; cotyledons semiterete, slightly broader and shorter (rarely longer) than the radicle.—Erect or diffuse shrubs or rarely trees, glabrous, tomentose, canescent, lepidote, or pubescent. Leaves alternate or rarely opposite, entire or rarely dentate, exstipulate. Flowers axillary, solitary or fascicled, subsessile or pedicellate. Bracts small or absent.

A small Order of about 6 genera and 80 species, mostly Australian, with a few Polynesian representatives, ranging from the Sandwich Islands to Mauritius; two others in China and Japan, one in the West Indies, two in South Africa, and the following Tropical African monotype, whose systematic position, however, is somewhat doubtful.

1. **ZOMBIANA**, Baill. Hist. des Pl. ix. 420.

Sepals 5, narrowly linear, united only at the base. Corolla-tube narrowly campanulate; limb somewhat 2-lobed, with 5 imbricate lobes. Stamens didynamous, slightly unequal, affixed to the base of the tube; filaments filiform; anthers ovate, retrorse, opening by two slits. Ovary 2-celled; ovules 2 in each cell, descending; style slender, capitellate. Fruit drupaceous; exocarp slender; pyrenes 4; seeds descending; embryo exalbuminous; radicle superior; cotyledons ovate, fleshy.—A small shrub. Leaves alternate, petiolate. Flowers very similar to those of *Myoporum*, subsessile in the upper leaf-axils or terminal with a few leaves under the calyx.

Endemic.

1. **Z. africana**, Baill. Hist. des Pl. ix. 421. A small shrub. Branches terete, softly pubescent when young, afterwards nearly glabrous, and striate with numerous slightly wavy ridges; nodes thickened. Leaves alternate or sometimes appearing fascicled by arrest of the lateral branches, shortly petiolate, elliptic-lanceolate, obtuse, crenulate, pilose beneath and at the margin, sparingly so above, $\frac{1}{2}$ – $1\frac{1}{4}$ in. long, 2–4 lin. broad; primary nerves 2 or 3 pairs, very oblique; petioles $\frac{1}{2}$ –1 lin. long. Flowers and fruit not seen.—Wettst. in Engl. & Prantl, Pflanzenfam. iv. 3 B. 360; Briquet in Bull. Herb. Boiss. iv. 324. *Myoporum*, sp. africana, Benth. Fl. Austr. v. 2, in obs., and in Benth. et Hook. f. Gen. Pl. iii. 1124, in obs.

Upper Guinea. Niger Territory, Barter, 1143!

In the absence of good material, the systematic position of this genus must remain doubtful. Bentham, in the Flora Australiensis, l.c., regarded it as a species of *Myoporum*, but subsequently (Gen. Pl. l.c.) retracted that opinion. Dr. J. Briquet, who has studied the histology of this plant, suggests that it may belong to *Selaginæ* or *Verbenacæ*, but its fruit does not agree with that of the former order, nor the position of the radicle with that of the latter. The generic name derived from a place-name, Zomba—not Zomba in British Central Africa—is apt to mislead, as the plant has been found only on the western side of the continent.

ORDER C. **SELAGINEÆ** (by R. A. Rolfe).

Flowers hermaphrodite, irregular. Calyx inferior, 5-fid, 5-partite, or through the segments being variously connate or deficient, 3- or 2-partite or spathaceous. Corolla gamopetalous; base shortly or slenderly tubular; throat usually broader; limb spreading, normally 5-fid, sometimes 4-fid through the two posticous lobes being united or the anticous absent; sometimes more or less bilabiate; lobes equal or the posticous pair shorter. Stamens 4, didynamous, or reduced to 2, inserted on the corolla-tube, exerted or included, alternating with the corolla-lobes; filaments filiform or very slightly thickened at the base; anthers 1-celled, obliquely basifixed or versatile, dehiscing longitudinally. Disc hypogynous, annular, unilateral and glandlike, or inconspicuous. Ovary superior, 2-celled or rarely by abortion obliquely 1-celled; style terminal, filiform, simple, acute, obtuse or minutely bifid, stigmatiferous at the apex but not or slightly thickened. Ovules solitary, pendulous, anatropous. Fruit small, included within the calyx, indehiscent, 2-celled, or by abortion 1-celled, or separating into 2 1-seeded nutlets; pericarp slightly fleshy, crustaceous or somewhat woody, rarely membranous, sometimes corky and with a pair of spurious lateral cells in either carpel. Seeds pendulous, usually oblong and terete; testa membranous; albumen fleshy; embryo terete, straight; radicle superior; cotyledons narrow.—Small heathlike shrubs or undershrubs, tufted perennial herbs, or rarely small annuals. Leaves alternate, fascicled, or rarely the lower ones opposite, cauline or rarely radical, entire or toothed, often narrow and rigid or coriaceous. Flowers small, solitary in the axils of the bracts or rarely shortly pedicelled with the bract, arranged in terminal elongated spikes, corymbose panicles, or sometimes lateral towards the ends of the branches. Corolla lilac-purple, white or rarely yellow.

A small Order of 9 genera and about 200 species, mostly concentrated in South Africa, with a few representatives in Tropical Africa, one in Madagascar; with an outlying genus widely dispersed through the north temperate zone, another in the Mediterranean region, and a single monotype in Socotra. A species of *Dischisma* was collected by Drummond at the Swan River, W. Australia, where it is reported to be abundant, though believed to be only an accidental introduction.

Calyx spathaceous. Corolla-limb expanded behind, 4-lobed	1. HEBENSTREITIA.
Calyx campanulate, 2-5-lobed. Corolla-limb more or less equally 5-lobed	2. SELAGO.

1. **HEBENSTREITIA**, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1127.

Calyx membranous or hyaline, spathaceous, entire or emarginate. Corolla-tube slender, divided in front down to the middle, dilated above into a 4-lobed flat or concave limb; lobes subequal or the inner pair longer or sometimes partly united, rarely with a fifth minute lobe in the fissure. Stamens 4, didynamous, affixed to the margins of the

fissure below the lobes, included; filaments short; anthers oblong or linear, perfectly 1-celled. Ovary 2-celled; style entire. Fruit oblong or ovate, subterete or compressed; carpels both perfect or one abortive, rarely dividing into separate nutlets; pericarp somewhat hardened, sometimes corky and with a pair of spurious lateral cells in each carpel. Seeds oblong, cylindric.—Small shrubs, undershrubs, or annual herbs. Leaves alternate or the lower opposite, narrow or sometimes broad, entire or toothed. Spikes terminal, often dense, short or elongate. Flowers sessile, white or yellow, rarely pink. Bracts mostly short, broad and imbricate, the lower ones sometimes leaf-like.

Species about 20 in South Africa, one extending thence into Tropical Africa, where it is very widely diffused, and one only in Tropical Africa.

Corolla 4–6 lin. long 1. *H. dentata*.

Corolla 2½–3 lin. long 2. *H. Holubii*.

1. ***H. dentata***, *Linn. Sp. Pl. ed. i.* 629. A small shrub, 1–2 ft. high, more or less copiously branched. Branches glabrous or puberulous. Leaves numerous, linear or rarely linear-lanceolate, acute, entire or slightly toothed on the upper half, ¼–1½ (rarely up to 3½) in. long, or the radical sometimes longer, ¼–1 lin. broad, or rarely broader, glabrous or slightly puberulous. Spikes terminal, up to 6 in. long when in fruit, many-flowered, usually dense. Bracts ovate-lanceolate, acute or acuminate, margin often scarious, 2–2½ lin. long. Calyx oblong-lanceolate, acute, 1½–2 lin. long. Corolla 4–6 lin. long; lobes broadly oblong, very variable in shape and colour, the latter ranging from white or light yellow with an orange blotch on the limb to (according to *Johnston*) light pink with a crimson blotch, or even deep mauve. Fruit oblong, 1½–2 lin. long.—*Lam. Encycl. t.* 521; *Bot. Mag. t.* 483; *Choisy in DC. Prod. xii.* 3; *A. Rich. Tent. Fl. Abyss. ii.* 174; *Oliv. in Trans. Linn. Soc. ser. 2, ii.* 344; *Wettst. in Engl. Pfl. Ost-Afr. C.* 358. *H. dentata*, *Linn.*, var. *integrifolia*, *Choisy in DC. Prod. xii.* 4; *Oliv. in Trans. Linn. Soc. xxix.* 132. *H. angolensis*, *Rolfe in Journ. Bot.* 1886, 174.

Nile Land. Eritrea: near Saganeiti, 7200 ft., *Schweinfurth & Riva*, 1377! Abyssinia: Tigre; Mount Kubbi, in the middle and upper parts, 8000 ft. (?), *Schimper*, 239! Samen; Woitsoh Woha, at the sources of the River Ataba, *Steudner*, 1313! Shoa; Ankober, *Roth*, 489! and without precise locality, *Petit! Schimper*, 91B! British East Africa: crater south of Lake Naivasha, 7800 ft., *Thomson!* Leikipia, 6000–8000 ft., *Thomson!* Kavirondo; Nandi Range, *Scott-Elliot*, 6974!

Lower Guinea. Angola: in bushy places near the streams of Humpata, *Welwitsch*, 4786! 4787!

Mozamb. Dist. German East Africa: Karagwe, on dry hills, 4000–5000 ft., *Scott-Elliot*, 8187! 8212! Kilimanjaro, 9000–14,000 ft., *Thomson! Johnston*, 47! Usagara; Robeho Mountains, 4770 ft., *Speke & Grant!* British Central Africa: Nyasaland; on the higher Nyika Plateau, 6000–7500 ft., *Whyte!*

Also widely diffused in South Africa.

Like many widely diffused species, this is very polymorphic, and some of the forms at first sight appear distinct, though, after examining them many times, I have failed to find any distinguishing characters. Even the Angolan one, formerly considered distinct, whose leaves sometimes attain a length of 3½ inches, seems to pass into *H. dentata* by almost inappreciable stages. The colour, too, is very variable. On Mount

Kilimanjaro, Sir H. H. Johnston notes one form as having a "deep mauve corolla," though he adds it is doubtless a variant of the other with pink and white corolla; I fail to distinguish it from those with a white or light yellow corolla with a deep orange blotch.

2. **H. Holubii**, Rolfe. Plant $\frac{3}{4}$ ft. or more high. Branches glabrous. Leaves narrowly linear, subobtuse, entire, glabrous, $\frac{3}{4}$ – $1\frac{1}{4}$ in. long. Spikes up to 4 in. or more long in fruit, densely many-flowered. Bracts ovate-lanceolate, acuminate, $1\frac{1}{2}$ –2 lin. long. Calyx oblong, obtuse, membranous, semipellucid, 1 – $1\frac{1}{4}$ lin. long. Corolla $2\frac{1}{2}$ –3 lin. long, white; lobes very short, broadly cblong. Fruit oblong, $1\frac{1}{2}$ –2 lin. long. *Hebenstreitia*, sp., Burkill in Johnston, British Central Africa, 262.

Mozamb. Dist. British Central Africa: Rhodesia; Shesheke, *Holub*, 366! 388!

Flowers much smaller than in *H. dentata*, and leaves more slender.

2. SELAGO, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1128.

Calyx shortly 5-fid or deeply 2–5-partite. Corolla-tube short and broad, or narrow and elongated, somewhat broader in the throat; limb subequal or oblique, 5-lobed or somewhat bilabiate, with the two posticous lobes rather shorter and the median anticous lobe longer. Stamens 4, didynamous, inserted above or below the middle of the tube, longer or shorter than the corolla-lobes; filaments filiform; anthers perfectly 1-celled; the posticous filament occasionally represented by a small staminode. Ovary 2-celled; style obtuse, subclavate or minutely bifid at the apex. Fruit oblong, ovate or broad, included within the calyx, readily dividing into nutlets when mature; pericarp slender, crustaceous, or somewhat woody, rarely corky and with a pair of spurious lateral cells in each carpel.—Small shrubs or undershrubs, usually heath-like and much branched, sometimes small annual herbs. Leaves usually small or narrow, sometimes minute, alternate or the lower rarely opposite, often in axillary fascicles, entire or toothed. Flowers sessile in the axils of the bracts, or rarely shortly pedicelled with the bract, arranged in terminal, dense or lax spikes, branched corymbs or panicles, or sometimes lateral towards the end of the branches. Bracts ovate or narrow, imbricate or sometimes somewhat distant.

Species about 140, mostly concentrated in South Africa, with 21 Tropical African representatives and 1 in Madagascar.

Calyx 5-lobed.

Inflorescence distinctly corymbose or congested into small terminal heads.

Flowers shortly pedicelled; bracts more or less adnate to the pedicels.

Leaves lanceolate 1. *S. cœrulea*.

Leaves linear-lanceolate.

Corolla-tube $\frac{1}{2}$ – $\frac{3}{4}$ lin. long.

Stems and leaves viscous-pubescent 2. *S. viscosa*.

Stems and leaves softly pubescent 3. *S. tenuicaulis*.

Corolla-tube 1 lin. long.

- Leaves hispidulous on the midrib and margin 4. *S. Melleri*.
 Leaves hispidulous-pubescent all over 5. *S. blantlyrensis*.
 Leaves linear.
 Calyx $\frac{3}{4}$ lin. long 6. *S. whyteana*.
 Calyx $\frac{1}{2}$ lin. long 7. *S. milanjiensis*.
 Flowers sessile or subsessile.
 Corymbs as broad as, or broader than, long, often somewhat lax.
 Calyx-lobes longer than the tube 8. *S. Holstii*.
 Calyx-lobes equalling the tube 9. *S. Buchananii*.
 Heads densely congested, as long as broad 10. *S. Johnstoni*.
 Inflorescence thyrsoid 11. *S. thyrsoides*.
 Inflorescence spicate or shortly racemose, more or less lateral near the ends of the branches
 Corolla-tube $\frac{1}{2}$ – $\frac{3}{4}$ lin. long.
 Flowers shortly pedicelled 12. *S. Nyasæ*.
 Flowers subsessile 13. *S. Thomsoni*.
 Corolla-tube $1\frac{1}{4}$ – $1\frac{3}{4}$ lin. long.
 Leaves and calyx-segments linear-oblong (Western species).
 Leaves and stems minutely puberulous 14. *S. Welwitschii*.
 Leaves and stems pubescent 15. *S. Hapfneri*.
 Leaves and calyx-segments linear (Eastern species) 16. *S. Holubii*.
 Calyx 2-3-lobed.
 Leaves linear-lanceolate 17. *S. angolensis*.
 Leaves linear.
 Inflorescence more or less lax.
 Leaves 1-2 lin. long.
 Flowers sessile 18. *S. Dinteri*.
 Flowers shortly pedicelled 19. *S. amboensis*.
 Leaves 3-8 lin. long 20. *S. lacunosa*.
 Inflorescence congested into a narrow compound spike 21. *S. alopecuroides*.

1. ***S. cœrulea*, Rolfe.** Plant $\frac{3}{4}$ –1 ft. high, with woody rootstock. Branches erect, copiously pubescent. Leaves lanceolate or lanceolate-linear, subobtuse, pubescent, more or less fascicled, 3–8 lin. long. Racemes very short, aggregated in congested terminal corymbs, 1– $2\frac{1}{4}$ in. diam. Bracts linear-oblong, obtuse, hispidulous-pubescent, 1 lin. long. Pedicels adnate to the base of the bract. Calyx campanulate, hispidulous-pubescent, 5-lobed, $\frac{3}{4}$ lin. long; lobes oblong, obtuse, strongly ciliate, the lower two broader than the others, twice as long as the tube. Corolla blue (*Whyte*); tube $\frac{1}{2}$ lin. long; lobes rounded-oblong, two upper small, the others broad and longer than the tube.

Mozamb. Dist. British Central Africa: Nyasaland; summit of Nyika Plateau, 7000 ft., *Whyte*!

2. ***S. viscosa*, Rolfe.** Plant 1 ft. or more high, and rather lax. Branches viscous-pubescent. Leaves rather lax, lanceolate-linear, subobtuse, hispidulous, 3–8 lin. long. Flowers very shortly pedicelled, arranged in lax terminal corymbose panicles. Bracts oblong, obtuse, ciliate, 1 lin. long. Calyx campanulate, nearly glabrous, 5-lobed, $\frac{3}{4}$ lin. long; lobes oblong, subobtuse, ciliate, subequal, nearly twice as long as

the tube. Corolla-tube $\frac{1}{2}$ lin. long; lobes roundish-oblong, upper as long as the tube, lower rather longer.

Mozamb. Dist. German East Africa: Lower Plateau, north of Lake Nyasa, *Thomson!*

3. **S. tenuicaulis**, *Rolfe*. Branches erect, pubescent, about 6–9 in. long. Leaves linear-lanceolate, subobtuse, attenuate into a short petiole, pubescent, 4–9 lin. long, somewhat fascicled. Racemes very short, aggregated into a terminal corymb, 1–1 $\frac{1}{4}$ in. diam. Bracts linear-oblong, obtuse, pubescent, 1 lin. long. Pedicels adnate to the base of the bract. Calyx campanulate, pubescent, 5-lobed, $\frac{3}{4}$ lin. long; lobes strongly ciliate, acute, three times as long as the tube, lower two much broader than the others. Corolla-tube $\frac{1}{2}$ – $\frac{3}{4}$ lin. long; lobes rounded, two upper equalling the tube, the others rather longer.

Mozamb. Dist. British Central Africa: Nyasaland; between Mpata and commencement of Tanganyika Plateau, 2000–3000 ft., *Whyte!*

4. **S. Melleri**, *Rolfe*. Plant 9–15 in. high. Branches puberulous or pubescent. Leaves linear-lanceolate, subobtuse, hispidulous, chiefly so on the midrib and margins, 3–8 lin. long. Racemes very short, aggregated in loose or congested terminal corymbs, $\frac{3}{4}$ –2 in. diam. Bracts oblong, obtuse, ciliate, 1 lin. long. Calyx campanulate, minutely puberulous, 5-lobed, 1 lin. long; lobes oblong, subobtuse, ciliate, somewhat unequal, nearly twice as long as the tube. Corolla light blue (*Meller*); tube 1 lin. long; lobes rounded-oblong, half as long as the tube.

Mozamb. Dist. British Central Africa: Nyasaland; Manganja Range, Mount Chiradzulu, 1000 ft. and to the summit, *Meller!*

5. **S. blantyreensis**, *Rolfe*. Plant 1–1 $\frac{1}{2}$ ft. high, much branched. Branches pubescent, densely leafy. Leaves lanceolate-linear, subobtuse, hispidulous-pubescent, 4–8 lin. long. Flowers very shortly pedicelled, aggregated in corymbose panicles, 1–2 $\frac{1}{2}$ in. broad. Bracts linear-oblong, subobtuse, 1 $\frac{1}{4}$ lin. long, slightly hispidulous. Calyx campanulate, slightly hispidulous, 5-lobed, 1 lin. long; lobes oblong, obtuse, ciliate, subequal, about twice as long as the tube. Corolla-tube 1 lin. long; lobes roundish-oblong, lower half as long as the tube, upper rather shorter. Nutlets $\frac{3}{4}$ lin. long.

Mozamb. Dist. British Central Africa: Nyasaland; Blantyre, *Buchanan*, 7009!

6. **S. whyteana**, *Rolfe in Trans. Linn. Soc. ser. 2, iv. 35*. Plant about 1 ft. high, much branched. Branches densely puberulous, densely leafy. Leaves linear, subobtuse, puberulous, 3–7 lin. long. Flowers shortly pedicelled, aggregated in rather dense subcorymbose panicles, 1–4 $\frac{1}{2}$ in. broad. Bracts linear, obtuse, somewhat curved, 1–1 $\frac{1}{4}$ lin. long, subglabrous. Calyx campanulate, slightly puberulous, 5-lobed, $\frac{3}{4}$ lin. long; lobes linear, subobtuse, slightly ciliate, subequal, about as long as the tube. Corolla-tube $\frac{3}{4}$ lin. long; lobes roundish-oblong, upper half

as long as the tube, lower rather longer. Nutlets $\frac{3}{4}$ lin. long.—Wettst. in Engl. Pfl. Ost-Afr. C. 358.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, 6000 ft., *Whyte! McClounie, 77!*

7. **S. milanjiensis**, *Rolfe in Trans. Linn. Soc. ser. 2, iv. 35.* A small shrub, with puberulous branches. Leaves linear, subobtuse, 5-9 lin. long. Spikes short, terminal, numerous. Bracts linear-oblong, obtuse, concave, smooth, $\frac{3}{4}$ -1 lin. long. Calyx $\frac{1}{2}$ lin. long, 5-lobed; lobes unequal, linear-oblong, obtuse, ciliate. Corolla 1 lin. long; tube short; lobes rounded-oblong, obtuse.—Wettst. in Engl. Pfl. Ost-Afr. C. 358.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, *Whyte!*

8. **S. Holstii**, *Rolfe.* Plant $\frac{3}{4}$ -1 ft. high, much branched. Branches cinereous-pubescent, densely leafy. Leaves linear, obtuse, hispidulous, 3-8 lin. long. Flowers aggregated in corymbose panicles, $\frac{3}{4}$ -2 $\frac{1}{2}$ in. broad. Bracts ovate-oblong, obtuse, concave, ciliate on the margin, glabrous elsewhere, 1 lin. long. Flowers sessile. Calyx campanulate, nearly glabrous, 5-lobed, $\frac{3}{4}$ lin. long; lobes oblong, subobtuse, ciliate, rather longer than the tube, subequal. Corolla light blue; tube 1 lin. long; lobes orbicular, upper lobes half as long as the tube, lower rather longer. Nutlets $\frac{3}{4}$ lin. long.—*S. Thomsoni*, Wettst. in Engl. Pfl. Ost-Afr. C. 358, in part.

Mozamb. Dist. German East Africa: Usambara, Kwa Mshuza, *Holst, 9088!* British Central Africa: Nyasaland; Mount Zomba, 4000-6000 ft., *Whyte!* Zomba Plateau, 5000 ft., *Whyte!* Mount Chiradzulu, at 4000 ft., *Whyte!* Mlanje Plateau, *McClounie!*

9. **S. Buchananii**, *Rolfe.* Plant $\frac{3}{4}$ -1 ft. high, often much branched. Branches cinereous-puberulous, densely leafy. Leaves linear, subobtuse, hispidulous, 1 $\frac{1}{2}$ -4 lin. long. Flowers in terminal congested panicles, $\frac{1}{2}$ -1 $\frac{1}{2}$ in. broad. Bracts oblong, obtuse, subciliate, 1 lin. long. Flowers sessile. Calyx campanulate, hispid-pubescent, 5-lobed, 1 lin. long; lobes subequal, linear-oblong, obtuse, ciliate, as long as the tube. Corolla-tube 1 lin. long; lobes rounded-oblong, lower lobes about half as long as the tube, upper rather shorter. Nutlets $\frac{3}{4}$ lin. long.

Mozamb. Dist. British Central Africa: Nyasaland, *Buchanan, 43! 728!* Forest between Lake Shirwa and Lake Chiuta, and to the west of Lake Chiuta, *Cunningham, 19!*

10. **S. Johnstoni**, *Rolfe in Trans. Linn. Soc. ser. 2, ii. 344.* Plant 6-8 in. high. Branches puberulous. Leaves numerous, linear, obtuse, hispidulous, 2-4 lin. long. Racemes somewhat corymbose and aggregated into congested terminal heads, 4-7 lin. diam. Bracts linear-oblong, obtuse, ciliate, 1 $\frac{1}{2}$ lin. long. Flowers subsessile. Calyx campanulate, somewhat pubescent, 5-lobed, 1 lin. long; lobes triangular-oblong, sub-acute, ciliate, as long as the tube, the two lower somewhat larger and united to near the apex. Corolla pinkish (*Johnston*); tube broad, $\frac{3}{4}$ lin. long;

lobes rounded, nearly as long as the tube.—Johnst. Kilimanj. Exp. 343; Wettst. in Engl. Pfl. Ost-Afr. C. 358.

Mozamb. Dist. German East Africa: Kilimanjaro, 11,000 ft., *Johnston*, 147!

11. **S. thyrsoidea**, *Baker in Kew Bulletin*, 1898, 159. Plant suberect from a woody base, heath-like (*Whyte*). Branches 8–9 in. long, puberulous. Leaves numerous, somewhat fascicled, narrowly linear, subobtuse, $\frac{3}{4}$ – $1\frac{1}{4}$ in. long, about $\frac{1}{2}$ lin. broad. Inflorescence consisting of numerous short spikes, forming a dense thyrsoid panicle at the apex of the branches, $1\frac{1}{4}$ –2 in. long. Bracts linear, subobtuse, incurved, $1\frac{1}{2}$ lin. long. Calyx campanulate, $\frac{3}{4}$ lin. long, subequally 5-lobed; lobes oblong, obtuse, hirsute. Corolla blue (*Whyte*); tube $\frac{3}{4}$ lin. long; limb 5-lobed, three lower lobes rounded, as long as the tube, upper more oblong and longer.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, summit at 7000 ft., *Whyte*, 144!

12. **S. Nyasæ**, *Rolfe*. Plant 6–12 in. high. Branches puberulous. Leaves linear, obtuse, sometimes with a pair of short lateral teeth near the apex, glabrous or puberulous, $2\frac{1}{2}$ –6 lin. long. Racemes very short, aggregated in a short narrow terminal panicle, 1 – $1\frac{1}{2}$ in. long. Bracts linear, obtuse, slightly ciliate at the base, $1\frac{1}{2}$ lin. long. Flowers very shortly pedicelled. Calyx campanulate, puberulous, 5-lobed, $\frac{3}{4}$ lin. long; lobes oblong, obtuse, ciliate, about as long as the tube, the two lower broader than the upper. Corolla-tube $\frac{1}{2}$ lin. long; lobes oblong, longer than the tube.

Mozamb. Dist. German East Africa: higher plateau north of Lake Nyasa, *Thomson*! Portuguese East Africa: mountains to the east of Lake Nyasa, *Johnson*!

13. **S. Thomsoni**, *Rolfe in Journ. Linn. Soc.* xxi. 402. Plant 8–12 in. high. Branches puberulous or pubescent. Leaves linear or subspathulate-linear, obtuse, hispidulous, or puberulous, 3–7 lin. long. Racemes very short, aggregated in loose or somewhat congested terminal corymbs, $\frac{3}{4}$ – $1\frac{3}{4}$ in. diam. Bracts oblong, obtuse, ciliate, 1 lin. long. Flowers subsessile. Calyx campanulate, puberulous, 5-lobed, $\frac{3}{4}$ lin. long; lobes triangular-oblong, subacute, ciliate, as long as the tube, two lower larger than the upper. Corolla-tube broad, $\frac{3}{4}$ lin. long; lobes rounded-oblong, as long as the tube. Fruit $\frac{1}{2}$ – $\frac{3}{4}$ lin. long.—Johnst. Kilimanj. Exp. 343; Wettst. in Engl. Pfl. Ost-Afr. C. 358, in part.

Mozamb. Dist. German East Africa: Kilimanjaro, 9000–11,000 ft., *Thomson*, 35! *Johnston*, 117!

14. **S. Welwitschii**, *Rolfe in Journ. Bot.* 1886, 175 (*excl. Hereroland plant*). Plant $1\frac{1}{2}$ ft. high. Branches puberulous. Leaves linear or linear-lanceolate, obtuse, puberulous, or glabrous, 3–6 lin. long. Racemes short, loosely arranged along the branches. Bracts oblong, obtuse, ciliate at the base, 1 lin. long. Flowers subsessile.

Calyx campanulate, puberulous, 5-lobed, $\frac{3}{4}$ lin. long; lobes linear-oblong, obtuse, ciliate, divided almost to the base, two lower rather longer than the upper. Corolla-tube $1\frac{1}{2}$ lin. long; lobes rounded-oblong, a third as long as the tube. Fruit broadly ovoid-globose, somewhat compressed, $\frac{3}{4}$ lin. long.

Lower Guinea. Angola: Huilla; in thickets on hills around Lopollo, common, *Welwitsch*, 4788!

For the Hereroland plant formerly included here, see the next species.

15. **S. Hœpfneri**, *Rolfe*. Plant 9–12 in. high. Branches densely puberulous or nearly tomentose. Leaves linear-oblong or oblong, obtuse, hispidulous, 2–5 lin. long. Racemes short, loosely arranged along the branches. Bracts oblong or obovate-oblong, obtuse, hispidulous, $1\frac{1}{4}$ lin. long. Flowers subsessile. Calyx campanulate, pubescent, 5-lobed, 1 lin. long; lobes linear-oblong, obtuse, ciliate, divided almost to the base, subequal. Corolla-tube $1\frac{1}{2}$ – $1\frac{3}{4}$ lin. long; lobes rounded-oblong, a third as long as the tube.—*S. Welwitschii*, *Rolfe* in *Journ. Bot.* 1886, 175, in part.

Lower Guinea. German South-west Africa: Hereroland; at Okahandya, *Höpfner*, 42! Amboland; at Omulonga, *Schinz*! Oshiheke, near Olukonda, *Schinz*, 8!

This was originally referred to the preceding species.

16. **S. Holubii**, *Rolfe*. Plant 6–15 in. high. Branches densely puberulous or nearly tomentose. Leaves linear, obtuse, hispidulous or scaberulous, 2–5 lin. long. Racemes very short, loosely arranged along the branches. Bracts oblong, obtuse, hispidulous, $1\frac{1}{4}$ – $1\frac{1}{2}$ lin. long. Flowers sessile. Calyx campanulate, puberulous, 5-lobed, 1 lin. long; lobes linear, subobtuse, ciliate, divided to below the middle, subequal. Corolla-tube $1\frac{1}{2}$ lin. long; lobes rounded-oblong, a quarter as long as the tube. Fruit broadly ovoid-globose, somewhat compressed, $\frac{1}{2}$ – $\frac{3}{4}$ lin. long.

Mozamb. Dist. British Central Africa: Ngamiland; near the Zuga River. *McCabe*, 28! Rhodesia; Eastern Bamangwato Territory, at Tamasetze, *Holub*, 325! 326! 1088! 1089! 1090! 1091!

Also in South Africa.

17. **S. angolensis**, *Rolfe*. Plant 7–9 in. or more high. Branches very minutely puberulous. Leaves linear-lanceolate or linear, subobtuse, glabrous, 3–11 lin. long. Racemes short, arranged in a loose terminal corymb. Bracts linear-oblong, obtuse, somewhat curved, $1\frac{1}{2}$ lin. long. Flowers very shortly pedicelled. Calyx 2–3-lobed; lobes ciliate; lateral linear, subobtuse, 1 lin. long; dorsal minute or nearly obsolete. Corolla-tube $\frac{3}{4}$ lin. long; lobes rounded-oblong, half as long as the tube.

Lower Guinea. Angola: Huilla; between Huilla and Humpata, *Johnston*! By the Cunene and Cacula Var Rivers, *Newton*!

18. **S. Dinteri**, *Rolfe*. Plant 1 ft. or more high. Branches puberulous, densely leafy. Leaves linear, obtuse, hispidulous, 1–2 lin. long.; Flowers sessile, in short capitate heads, more or less lateral along

the upper parts of the branches. Bracts oblong, obtuse, rather fleshy, hispidulous and slightly ciliate, $\frac{3}{4}$ –1 lin. long. Calyx $\frac{1}{2}$ lin. long, 3-lobed, hispidulous; lobes lanceolate-oblong, acute, ciliate, lateral twice as long as the dorsal. Corolla-tube $\frac{1}{2}$ lin. long; lobes roundish-oblong, upper half as long as the tube, lower rather longer.

Lower Guinea. German South-west Africa: Hereroland; Swakop River, *Dinter*, 61!

19. **S. amboensis**, *Rolfe*. Branches about 8 in. long, slender, puberulous. Leaves linear-oblong, obtuse, somewhat fleshy, 1–2 lin. long, slightly rugose. Racemes short, lateral on short branchlets on the upper part of the branches. Bracts oblong, obtuse, $\frac{3}{4}$ lin. long. Flowers very shortly pedicelled. Calyx 2-lobed; segments linear, ciliate, $\frac{1}{3}$ lin. long. Corolla-tube $\frac{1}{3}$ lin. long; lobes oblong, rather shorter than the tube. Fruit reniform-globose, $\frac{1}{4}$ lin. long.

Lower Guinea. German South-west Africa: Amboland; Omatope, *Schinz*!

Nearly allied to the South African *S. paniculata*, Thunb., which it closely resembles, but the calyx-lobes are much narrower and the flowers smaller. The specimen seen consists of a single branch.

20. **S. lacunosa**, *Klotzsch in Peters, Reise Mossamb. Bot.* 255. Plant 6–12 in. high. Branches puberulous. Leaves linear or linear-lanceolate, obtuse, glabrous, 3–8 lin. long. Racemes short or somewhat elongated, loosely arranged along the branches. Bracts linear-oblong, obtuse, somewhat curved, $\frac{3}{4}$ lin. long. Flowers very shortly pedicelled. Calyx 2–3-lobed, glabrous; lobes minutely ciliate, lateral $\frac{1}{3}$ lin. long, dorsal minute or nearly obsolete. Corolla-tube $\frac{1}{2}$ lin. long; lobes rounded-oblong, half as long as the tube. Fruit reniform-globose, $\frac{1}{4}$ lin. long.—*Wettst. in Engl. Pfl. Ost-Afr. C.* 358.

Mozamb. Dist. Portuguese East Africa: on the banks and on an island of the Zambesi River, *Peters*! on sandbanks near Lupata, *Kirk*! British Central Africa: Northern Zambesia; Boruma, *Menyharth*, 991!

21. **S. alopecuroides**, *Rolfe in Journ. Bot.* 1886, 175. Plant 1–2 ft. high. Branches puberulous. Leaves numerous, linear-filiform, obtuse, glabrous or somewhat puberulous, 2–5 lin. long. Racemes very short, subsessile, crowded along the upper part of the branches. Bracts linear-oblong, obtuse, somewhat curved, membranous and ciliate at the margin, 1–1 $\frac{1}{4}$ lin. long. Flowers very shortly pedicelled. Calyx 3-lobed, glabrous; lobes ciliate; lateral oblong, obtuse, $\frac{1}{2}$ lin. long; dorsal rather smaller. Corolla-tube $\frac{3}{4}$ lin. long; lobes rounded-oblong, a third as long as the tube. Fruit reniform-globose, $\frac{1}{2}$ lin. long.—*O. Kuntze in Jahrb. Königl. Bot. Gart. Berlin*, iv. 270.

Lower Guinea. Angola: Huilla; about Lopollo, frequent in thickets, *Welwitsch*, 4789! 4790! Huilla, *Antunes*, 132! Humpata, Chella Mountains, *Johnston*! German South-west Africa: Hereroland; at Okahandya, on grassy plains, 3900 ft., *Marloth*! Swakop River, 1600–3300 ft., *Pechuel-Loesche (ex Kuntze)*, *Dinter*, 12!

Order CI. **VERBENACEÆ** (by J. G. Baker
and O. Stapf).

Flowers hermaphrodite, rarely polygamous, irregular or nearly regular. Calyx inferior, persistent; tube long or short; lobes usually 5, small or large. Corolla gamopetalous; tube campanulate, funnel-shaped or cylindric; limb 4-5-fid; lobes subequal or more or less distinctly bilabiate. Stamens usually 4, didynamous; filaments filiform; anthers dorsifixed, with 2 parallel or divaricate cells, dehiscing longitudinally. Ovary superior, sessile, entire or slightly lobed, bicarpellary, 2-4-celled, 2-4-ovuled; style terminal, entire with a terminal stigma or bifid at the apex. Fruit drupaceous with bony pyrenes, or capsular. Seeds erect, laterally attached or pendulous; albumen usually none or scanty; radicle usually very short.—Herbs, trees, or shrubs. Leaves usually opposite or verticillate, entire, toothed or laciniated, in *Vitex* usually digitately compound. Inflorescence centripetal or centrifugal. Flowers often showy and brightly coloured.

Species 700, mainly inhabiting the tropical regions of both hemispheres.

Flowers solitary 1. **CYCLOCHEILON.**

Flowers aggregated.

Inflorescence centripetal (spicate, racemose or capitate).

Ovary 2-celled; cells 1-ovuled.

Calyx short.

Fruit fleshy 2. **LANTANA.**

Fruit dry 3. **LIPPIA.**

Calyx long.

Perfect stamens 2 4. **BOUCHEA.**

Perfect stamens 4 5. **STACHYTARPHETA.**

Ovary 4-celled; cells 1-ovuled.

Fruit-calyx closed over the fruit; pyrenes 2 6. **PRIVA.**

Fruit-calyx open; pyrenes 4 7. **VERBENA.**

Ovary 8-celled; cells 1-ovuled 8. **DURANTA.**

Inflorescence centrifugal.

Inflorescence a compound cyme.

Leaves simple.

Pyrene 1, 4-celled 9. **PREMNA.**

Pyrenes 4, 1-celled.

Calyx-lobes 5, erect 10. **CLERODENDRON.**

Calyx-lobes 5, spreading, very accrescent 11. **HOLMSKIOLDIA.**

Leaves usually digitately compound 12. **VITEX.**

Inflorescence capitate 13. **AVICENNIA.**

1. **CYCLOCHEILON**, Oliv. in Kew Bulletin, 1895, 222
(by O. Stapf).

Calyx deeply bifid in the median plane, laterally flattened; tube very short, funnel-shaped; segments orbicular or reniform. Corolla 2-lipped; tube widened from a narrow cylindric base into a wide oblique throat; upper lip smaller than the lower, deeply 2-fid, exterior in bud; inner lip deeply 3-fid, lobes subequal, middle lobe innermost in

bud. Stamens 4, didynamous, inserted low down in the corolla-tube; filaments filiform, loosely villous upwards, the anterior pair longer; anthers almost enclosed in the throat, pendulous, cells more or less diverging, loosely hairy. Ovary entire, laterally compressed, perfectly or imperfectly 2-celled; carpels in the median plane; ovules 1 or 2 in each cell, subbasal, collateral, ascending, anatropous. Style long, filiform; stigma entire, papillose all round. Fruit unknown.—Dwarf shrubs; leaves opposite, small, hispidulous. Flowers solitary (representing reduced cymes) in the axils of the leaves of very short branchlets; pedicels finely filiform, 2-bracteate.

Species 2, in Tropical East Africa and Tropical Arabia.

Cyclocheilon was placed in *Scrophulariaceæ* by Oliver and Engler. The renewed examination of the type of the genus, and the discovery of a second species of which there is at Kew material much better than that on which the genus was based, has shown that the affinity of *Cyclocheilon* is with *Nesogenes*, DC., in *Verbenaceæ*.

Bracteoles close to the calyx, broad, $1\frac{1}{2}$ in. long 1. *C. somalense*.

Bracteoles somewhat distant from the calyx, narrow,
 $\frac{1}{2}$ lin. long 2. *C. eriantherum*.

1. **C. somalense**, *Oliv. in Kew Bulletin*, 1895, 223. Dwarf divaricately branched shrub, densely hispidulous all over with white hairs; internodes of branches 3–5 lin. long. Leaves obovate to elliptic, obtuse, narrowed at the base, $1\frac{1}{2}$ –2 lin. by 1 – $1\frac{1}{2}$ lin., entire, rather fleshy. Pedicels about 1 lin. long. Bracts close to the calyx, spathulate to broadly obovate, $1\frac{1}{2}$ lin. long. Calyx suborbicular-reniform, subcordate at the base (seen from the side), 3 – $3\frac{1}{2}$ lin. long, 3 – 5 lin. broad. Corolla-tube 3 – 5 lin. long; upper lip $1\frac{1}{2}$ lin. long; lobes of lower lip 2 – $2\frac{1}{2}$ lin. long and about as broad or slightly broader. Anterior filaments $3\frac{1}{2}$ lin. long, posterior $2\frac{1}{2}$ lin. long; anther-cells apiculate at the base, 1 lin. long. Ovary ovoid, quite glabrous, imperfectly 2-celled; cells 2-ovuled; style glabrous.—*Oliv. in Hook. Ic. Pl. t. 2439. C. eriantherum*, *Engl. (in part) in Ann. Istit. Bot. Roma, vii. (1897), 26, and in Engl. Jahrb. xxiii. 508.*

Nile Land. Western British Somaliland, *Mrs. Lort-Phillips!*

Var. *Kelleri*, *Stapf*. The whole plant less densely hispidulous, hairs slightly coarser. Leaves spathulate, 3 – 5 lin. by 1 lin. Bracts spathulate. Calyx 4 – 5 lin. by $3\frac{1}{2}$ – 5 lin. Corolla-tube about 6 lin. long.—*C. Kelleri*, *Engl. in Ann. Istit. Bot. Roma, vii. 26.*

Nile Land. Galla country, Abdallah, *Keller*, 205!

2. **C. eriantherum**, *Engl. in Ann. Istit. Bot. Roma, vii. 26, and in Engl. Jahrb. xxiii. 508 (in part)*. Dwarf shrub, 2–3 ft. high; branches obliquely erect or divaricate, stiff, hispidulous when quite young, soon glabrescent, at length ashy-grey or yellowish; flowering branches reduced to densely white woolly cushions. Leaves linear-spathulate, obtuse, 3 – 6 lin. by 1 – $1\frac{1}{2}$ lin., entire, rather fleshy, scabrid on both sides. Pedicels capillary, glabrous, $2\frac{1}{2}$ – 3 lin. long. Bracts $\frac{3}{4}$ – 1 lin. below the calyx, filiform to linear, $\frac{1}{2}$ lin. long. Calyx orbicular or

broadly elliptic, cordate at the base, 3–4 lin. by 3–3½ lin., glabrous. Corolla white; tube 3½–4 lin. long on the back, 4½–5½ lin. long in front; upper lip 1½ to almost 2 lin. long; lobes of lower lip up to 2½ lin. long and almost as broad. Anterior filaments 2½ lin., posterior 2 lin. long; anther-cells obtuse at both ends, 1 lin. long. Ovary truncate-obovoid, symmetrical or slightly oblique (seen from the side); imperfectly or perfectly 2-celled; cells 1-ovuled or the anterior larger and 2-celled; style scantily pilose.—*C. minutibracteolatum*, Engl. ll. cc. *Tinnea erianthera*, Vatke in Linnæa, xliii. 539. *T. arabica*, Baker in Kew Bulletin, 1894, 339. *T. sp.* Oliv. in Trans. Linn. Soc. ser. 2, ii. 347.

Nile Land. British Somaliland: near Maid, *Hildebrandt*, 1515! Galla country: in the desert between Dolo and the Dana River, *Riva*, 1175! Abdallah, *Keller*, 187!

Mozamb. Dist. British East Africa: Ukamba; in Ulu district, *Scott-Elliott*, 6378! German East Africa: Kilimanjaro, 5000 ft., *Johnston*!

Also in Southern Arabia.

2. LANTANA, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1142.

Calyx small, campanulate, 5-toothed. Corolla-tube cylindric; limb patent, obscurely bilabiate; lobes 5, orbicular. Stamens 4, didynamous, included in the corolla-tube; anthers ovoid, with parallel cells; ovary 2-celled; cells 1-ovuled; style short; stigma rather stout; ovules attached at or near the base of the cells. Fruit drupaceous; flesh thin; endocarp 2-celled or splitting into 2 1-seeded pyrenes. Seeds exalbuminous.—Erect or subscandent shrubs, rarely herbs. Branches usually tetragonal. Leaves opposite or ternate, petioled, inciso-crenate, more or less rugose. Spikes dense, peduncled from the axils of the leaves; bracts persistent, ovate or lanceolate. Flowers small, yellow, white or red, often variable in colour in the same spike.

Species about 50, mostly Tropical American.

Bracts lanceolate or linear.

Leaves opposite 1. *L. Camara*.
Leaves ternate 2. *L. antidotalis*.

Bracts ovate.

Leaves usually two to a node.

Spikes finally oblong.

Corolla-limb $\frac{1}{2}$ in. diam. 3. *L. viburnoides*.

Corolla-limb $\frac{1}{6}$ in. diam. 4. *L. salvifolia*.

Spikes permanently globose 5. *L. petitiana*.

Leaves usually three to a node 6. *L. trifolia*.

Bracts oblong 7. *L. concinna*.

1. **L. Camara**, Linn.; *Schauer* in DC. Prod. xi. 598. An erect shrub, 4–8 ft. high. Branches pubescent, tetragonal, usually armed with irregular hooked prickles. Leaves opposite, petioled, cordate-ovate, acute, 1–3 in. long, crenate, very scabrous above, densely pubescent beneath. Heads permanently globose, 1 in. diam.; bracts lanceolate, $\frac{1}{4}$ in. long. Corolla-tube slender, pubescent, $\frac{1}{3}$ – $\frac{1}{2}$ in. long;

limb $\frac{1}{8}$ in. diam. Outer flowers red; inner yellow-white. Drupe black, shining, the size of a small pea.—*L. aculeata*, Linn. Syst. Veg. ed. xiv. 566, ex parte; Bot. Mag. t. 96. *L. scabrida*, Ait. Hort. Kew. ed. 1, ii. 352.

Upper Guinea. Sierra Leone: Freetown, *Kirk*, 44! *Johnston*, 1! in gardens, *Barter*! Gold Coast: Cape Coast Castle, *Vogel*, 28! 69! Accra, *Vogel*, 4! Lagos, *Moloney*, 15! *Rowland*! Egba country, at Otta, *Barter*, 3318! Cameroons: Batanga, *Bates*, 166!

Lower Guinea. Angola, *Welwitsch*, 5650! 5658! 5676! 5715! 5722! 5723! Ambriz, *Monteiro*!

A native of Tropical America, now established in many places in the Old World.

2. ***L. antidotalis***, *Schumach. & Thonn.*; *Schauer in DC. Prod.* xi. 598. Branches subhexagonal, hispid, unarmed or prickly. Leaves ternate, ovate, acuminate, coarsely crenate, rugose. Heads globose; bracts linear-subulate, the outer as long as the corolla-tube. Corolla-tube pubescent, $\frac{1}{4}$ in. long.

Upper Guinea. Senegambia, *Lelièvre*. Guinea, *Thonning*.

3. ***L. viburnoides***, *Vahl*; *Schauer in DC. Prod.* xi. 605. An erect little-branched shrub. Stems densely hairy upwards, without any prickles. Leaves opposite, shortly petioled, ovate, often 3–4 in. long, conspicuously crenate, scabrous above, slightly rugose and pubescent beneath. Spikes axillary, peduncled, elongating, finally 1–1 $\frac{1}{2}$ in. long; bracts ovate, acute, very hairy, the upper $\frac{1}{6}$ in., the lower $\frac{1}{4}$ in. long. Corolla very small; tube pubescent, $\frac{1}{8}$ in. long; limb $\frac{1}{12}$ in. diam. Drupe purple, the size of a small pea, ribbed vertically when dry.—*A. Rich. Tent. Fl. Abyss.* ii. 168; *Schweinf. Beitr. Fl. Aethiop.* 120; *Engl. Hochgebirgsfl. Trop. Afr.* 355. *Lippia Schimperii*, *Hochst. in Flora*, xxiv. (1841) i. *Intell.* 23.

Upper Guinea. Niger Territory: Nupe, *Barter*, 1286!

Nile Land. Abyssinia: at the foot of Mount Sholoda, *Schimper*, 257! and without precise locality, *Schimper*, 455! British East Africa: Jur; Jur Ghattas, *Schweinfurth*, 2342!

Mozamb. Dist. German East Africa: Kilimanjaro, 4400 ft., *Johnston*, 91! *Volkens*, 265!

Also in Arabia.

4. ***L. salvifolia***, *Jacq. Hort. Schoen.* iii. 18, t. 285; *Schauer in DC. Prod.* xi. 605. A much-branched shrub, 3–6 ft. high. Stems without any prickles, densely hairy upwards. Leaves opposite, shortly petioled, ovate, crenate, 1–2 in. long, very rugose in the typical form, scabrous above, densely pubescent beneath, with raised veins. Spikes at first globose, finally oblong, about an inch long; bracts ovate, acute, hairy, the lower $\frac{1}{4}$ in. long. Corolla lilac or pink; tube about $\frac{1}{4}$ in. long; limb $\frac{1}{8}$ in. long. Drupe purple, edible.—*Engl. Hochgebirgsfl. Trop. Afr.* 355. *L. Kisi*, *A. Rich. Tent. Fl. Abyss.* ii. 169; *Schweinf. Beitr. Fl. Aethiop.* 120. *Lippia? kituiensis*, *Vatke in Linnæa*, xliii. 528.

L. indica, Roxb.; Wight, Ic. t. 1464; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 563. *L. alba*, Schauer in DC. Prod. xi. 606, vix Miller.

Upper Guinea. Dagomba: Salaga, Krause!

Nile Land. Nubia: coast region, Bent! Hor Tamanib, Lord, 10! Eritrea: near Acrur, 6000 ft., Schweinfurth & Riva, 1013! Saganeiti, 6800–7400 ft., Schweinfurth & Riva, 1813! Keren, Steudner, 1303! Abyssinia: Adowa, Quartin-Dillon & Petit, 121! Mountains near Jaja, 3500–6000 ft., Schimper, 2193! banks of the Hawash River, Roth, 488! Shire, Quartin-Dillon! and without precise locality, Schimper, 48! 377! 488! 747! Somaliland, Miss Edith Cole! Mrs. Lort-Phillips! British East Africa: Uganda, Wilson, 98! Lykipia, 6000–8000 ft., Thomson! Kapte Plateau, 5000–6000 ft., Thomson! Ukamba, above 4000 ft., Scott-Elliot, 6341! Hildebrandt, 2738! Maungu Mountain, 2000 ft., Johnston! Mombasa, Wakefield! Kirk! Hildebrandt, 1988! Bojer! Ribe, near Mombasa, Wakefield! Wanga, Smith!

Lower Guinea. Lower Congo, Dupuis. Angola, Welwitsch, 5667 partly! 5691! 5693! 5720! 5729! 5742! 5755! 5756! 5761! Elephants Bay, Curror, 20 German South-West Africa: Amboland; Olukonda, Schinz, 460!

South Central. Congo Free State: Lomami River, Laurent! Mtowa, on Lake Tanganyika, Descamps.

Mozamb. Dist. Zanzibar, Bojer! German East Africa: Usambara; Tanga, Volkens, 149! Amboni, Holst, 2687! Kilimanjaro; Chagga District, New! and at 5000–6000 ft., Johnston! Lake Tanganyika, Cameron! Kavala Island, Carson, 24! 25! East shore of Lake Tanganyika, Scott-Elliot, 8335! Lower Plateau, north of Lake Nyasa, Thomson! British Central Africa: Urungu; Fwaubo, 5000 ft., Nutt! Carson! Nyasaland; Nyika Plateau, 6000–7000 ft., Whyte, 140! 205! Mount Chiradzulu, 4000 ft., Whyte! Shire Highlands, Buchanan, 88! 245! 326! Scott-Elliot, 8568! Manganja Hills, 3000 ft., Kirk! Meller! Mambane, 3000–4000 ft., Kirk! Rhodesia; Leshumo Valley, Holub! Matabeleland, Elliott! Ngamiland; Kobis to Siaw Valley, Baines!

Also in South Africa and India.

The synonyms *L. indica* and *L. alba* belong especially to the more common form with the leaves in twos. The other form which differs in having the leaves in threes, but is not to be distinguished by any other character, occurs in various parts of Africa.

5. ***L. petitiana***, A. Rich. Tent. Fl. Abyss. ii. 169. A much-branched low shrub, with very slender shortly hispid branchlets without any prickles. Leaves opposite, ovate, shortly petioled, crenate, $\frac{1}{2}$ in. long, very rugose, scabrous above, very hairy beneath. Heads permanently globose, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam.; bracts ovate, acute, very hairy, $\frac{1}{8}$ in. long. Corolla lilac; tube about as long as the bract; limb $\frac{1}{12}$ in. diam.—Vatke in Linnæa, xliii. 527; Franchet, Sert. Somal. 49. *L. microphylla*, Franchet, Sert. Somal. 49.

Nile Land. Abyssinia: Wojerat, Petit! Somaliland! Révoil, Darra-as, 5000 ft., Miss Edith Cole! Mrs. Lort-Phillips! Maid, Hildebrandt, 1418! Adda Galla, James & Thrupp!

Also in Arabia and Afghanistan.

6. ***L. trifolia***, Linn.; Schauer in DC. Prod. xi. 606. A little-branched undershrub. Stems without any prickles, hairy upwards. Leaves in threes, shortly petioled, ovate or oblong, faintly crenate, 3–4 in. long, slightly scabrous above, very slightly rugose, thinly

pubescent beneath. Spikes solitary from the axil of each leaf, shortly peduncled, at first globose, finally oblong; bracts green, ovate, acute, hairy, the lower $\frac{1}{4}$ in. long. Corolla pink or lilac, with a yellow eye; tube $\frac{1}{4}$ in. long; limb $\frac{1}{4}$ in. diam. Drupe purple.—Bot. Mag. t. 1449; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 563.

Upper Guinea. Lagos, Rowland!

Nile Land. British East Africa: Jur; Jur Ghattas, Schweinfurth, 2207! Niamniam; Nabambisso River, Schweinfurth, 3749!

A native of Tropical America, also naturalised in Tropical Asia.

7. **L. concinna**, Baker in Kew Bulletin, 1895, 223. A much-branched erect shrub. Branches very slender, pubescent. Leaves opposite, petioled, ovate, $\frac{1}{2}$ – $\frac{3}{4}$ in. long, crenate, rugose, green on both surfaces, slightly pubescent above, densely pubescent beneath. Heads globose, $\frac{1}{2}$ in. diam., solitary, on ascending peduncles 1–2 in. long from the axils of the leaves; bracts oblong, foliaceous, ascending, pubescent, $\frac{1}{4}$ in. long. Calyx small. Corolla-tube cylindrical, pilose, $\frac{1}{6}$ in. long; lobes orbicular, patent.

Nile Land. British Somaliland: Wadaba; Miss Edith Cole! Mrs. Lort-Phillips!

3. LIPPIA, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1142.

Calyx small, membranous, 2–4-lobed, compressed and 2-keeled in the Tropical African species. Corolla-tube cylindrical; limb patent, obscurely bilabiate, with 4 round lobes. Stamens didynamous, inserted about the middle of the corolla, included or just exerted. Ovary 2-celled; cells 1-ovuled; style short; stigma oblique or recurved; ovules inserted at or near the base of the cells. Fruit without any fleshy layer outside the two bony pyrenes. Seeds exalbuminous.—Undershrubs, rarely herbs, usually more or less hairy and glandular. Leaves opposite, ternate or verticillate. Spikes dense, small, globose or oblong in the Tropical African species. Flowers small, each subtended by a persistent bract.

Species about 60; mostly Tropical American.

Trailing herb rooting at the nodes	1. <i>L. nodiflora</i> .
Erect undershrubs.	
Bracts orbicular, obtuse.	
Peduncles very short	2. <i>L. Oatesii</i> .
Peduncles long	3. <i>L. Rudula</i> .
Bracts cuspidate.	
Leaves small, orbicular or obovate	4. <i>L. somalensis</i> .
Leaves small, oblong, rugose	5. <i>L. asperifolia</i> .
Leaves larger, oblong or oblanceolate-oblong, scarcely rugose	6. <i>L. adoensis</i> .
Bracts acuminate.	
Leaves opposite	7. <i>L. ukambensis</i> .
Leaves ternate	8. <i>L. Burtonii</i> .
Bracts acute	9. <i>L. plicata</i> .

1. **L. nodiflora**, *Rich.*; *Schauer in DC. Prod.* xi. 585. A perennial herb. Stems wide creeping, slender, obscurely pubescent, rooting from the nodes. Leaves opposite or fascicled at the nodes, obovate, shortly petioled, sharply dentate in the upper half. Spikes usually solitary, on long slender peduncles, at first globose, $\frac{1}{4}$ in. diam., afterwards oblong; bracts orbicular, obtuse, or obscurely cuspidate, the outer $\frac{1}{8}$ in. diam. Calyx $\frac{1}{4}$ in. long. Corolla about as long as the bract. Capsule $\frac{1}{16}$ in. diam., slightly adherent to the calyx.—A. Rich. Tent. Fl. Abyss. ii. 168; Schweinf. Beitr. Fl. Aethiop. 120; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 563. *Zapania nodiflora*, Lam. Illustr. i. 59.

Upper Guinea. Senegal, *Heudelot!*

Nile Land. Abyssinia: near Aguar, *Schimper*, 1010! and without precise locality, *Schimper*, 260! 1852! British Somaliland: Dooloo, *Miss Edith Cole!* Golis Range, *Mrs. Lort-Phillips!*

Lower Guinea. Angola, *Welwitsch*, 5638! 5694! *Curror!*

Mozamb. Dist. German East Africa: East shore of Lake Tanganyika, *Scott Elliot*, 8367! Portuguese East Africa: Quilimane, *Kirk!* Lower Zambesi; near Expedition Island, *Kirk!* British Central Africa: River Shire, Elephant Marsh, *Kirk!*

Also in the Mediterranean Region, South Africa, Madagascar, and the warmer regions of Asia and America.

2. **L. Oatesii**, *Rolfe in Oates, Matabeleland*, ed. 2, 407. An undershrub with slender woody branchlets, clothed with very short whitish pubescence. Leaves in threes, nearly sessile, oblong, obscurely crenate, subcoriaceous, 1–1½ in. long, rather rugose, subscabrous above, pubescent, with raised veins beneath. Heads globose, $\frac{1}{2}$ in. diam., in fours on short peduncles from the upper nodes; bracts orbicular, very hairy, not cuspidate, the outer $\frac{1}{8}$ in. broad. Flowers not longer than the bracts.

Mozamb. Dist. British Central Africa: South African Gold Fields, *Baines!* Matabeleland, *Oates!*

3. **L. Radula**, *Baker*. An undershrub 3–4 ft. or more high. Stem stout, shortly pubescent, not branched below the inflorescence. Leaves in threes, sessile, oblong, distinctly crenate, rigidly coriaceous, very scabrous on the upper surface, densely pubescent, with raised veins beneath, the lower 3–4 in. long, 1½–2 in. broad. Heads oblong or ovate, $\frac{1}{2}$ in. long, a few aggregated together at the ends of long stiff ascending peduncles so as to form an ample terminal panicle; bracts closely imbricated, orbicular, very hairy, not cuspidate, the outer $\frac{1}{6}$ in. broad. Flowers scarcely longer than the bracts.

Nile Land. British East Africa: Bongo; Sabbi River, *Schweinfurth*, 2616!

4. **L. somalensis**, *Vatke in Linnæa*, xliii. 527. A much-branched undershrub 3–4 ft. high, with very scabrous slender woody branchlets. Leaves in pairs, shortly petioled, obovate or orbicular, obtuse, very rigid, under an inch long, crenate, scabrous and rugose

above, pubescent with much-raised veins beneath. Heads globose, $\frac{1}{3}$ in. long, 2-4 from the upper nodes on long stiff ascending peduncles; bracts very closely imbricated, pubescent, orbicular, with a large cusp, the outer $\frac{1}{6}$ in. broad. Corolla milk-white, not longer than the bract.

Nile Land. British Somaliland: Serrut Mountains, near Maid, 5800 ft., *Hildebrandt*, 1443!

5. **L. asperifolia**, *Rich.*; *Schauer in DC. Prod.* xi. 583. A much-branched shrub, reaching a height of 12-15 ft. Stems woody, clothed with short whitish stiff hairs. Leaves opposite or ternate, shortly petioled, oblong, crenate, very rugose, $1\frac{1}{2}$ -2 in. long, very pubescent beneath and the veins raised. Heads from the axils of many of the leaves, not more than 4-6 to a node, not forming terminal corymbs above the leaves, $\frac{1}{4}$ in. diam., at first globose, finally oblong; bracts broad, ovate, cuspidate, very hairy, the outer $\frac{1}{2}$ in. broad. Corolla scarcely longer than the bract; limb whitish. Fruits very small, light brown.—*L. scabra*, *Hochst.* in *Flora*, 1845, 68.

Nile Land. Abyssinia: Ankober, *Roth*, 10, 523! British East Africa: Kapte Plateau, 5000-6000 ft., *Thomson*! Ukamba, 4000 ft., *Scott-Elliott*, 6331!

Lower Guinea. Angola, *Welwitsch*, 5749! 5750!

South Central. Congo Free State: Mtowa, *Descamps*.

Mozamb. Dist. Zanzibar, *Hildebrandt*, 995! *Bojer*! German East Africa: Usambara; Kwa Mshuza, *Holst*, 8893! Kilimanjaro, 5000 ft., *Volkens*, 218! Lower Plateau, north of Lake Nyasa, *Thomson*! Portuguese East Africa: Mozambique, *Forbes*! Lunbo River, *Kirk*, 17! Lower Zambesi; Shupanga, *Kirk*! Lower Valley of the River Shire, *Meller*! at the foot of Morambala Mountain, *Kirk*! British Central Africa: Nyasaland; Mount Chiradzulu, 4000 ft., *Whyte*! Matabeleland, *Elliott*! *Oates*!

Also at the Cape and in Tropical America.

6. **L. adoensis**, *Hochst.*; *Schauer in DC. Prod.* xi. 578. An erect undershrub reaching a height of 5-7 ft., with shortly pubescent branchlets. Leaves 2-4 or sometimes more in a whorl, nearly or quite sessile, oblong or oblanceolate-oblong, subcoriaceous, obscurely crenate, but little rugose, rather scabrous on the upper surface, thin pubescent beneath, the lower sometimes 4-5 in. long. Inflorescence very variable, the very numerous heads sometimes forming a dense terminal panicle, the upper internodes sometimes long, with several heads from each node on short peduncles. Heads permanently globose, $\frac{1}{4}$ - $\frac{1}{3}$ in. diam.; bracts hairy, ovate, cuspidate, the outer $\frac{1}{8}$ in. broad. Calyx villous, $\frac{1}{16}$ in. long. Corolla whitish, not longer than the bract.—A. *Rich. Tent. Fl. Abyss.* ii. 167; *Oliv. in Trans. Linn. Soc.* xxix. 132. *L. grandifolia*, *Hochst. ex A. Rich. Tent. Fl. Abyss.* ii. 167. *L. Schimperii*, *Walp. Rep.* iv. 53, non *Hochst.* *Lantana abyssinica*, *Otto & Dietr. in Gartenzeit.* ix. 379.

Upper Guinea. Senegal, *Heudelot*, 103! Senegambia; Mbidjem, *Thierry*, 227! Gambia, *Ingram*! *Brown-Lester*, 4! 28! Sierra Leone: Wallia on the River Scarcies, *Scott-Elliott*, 4262! 4285! Talla Hills, near Durunia, *Scott-Elliott*, 4878! Lagos, *Millen*, 143! Borgu, *Barter*, 768! Niger, *Baikie*, 11

Nile Land. Abyssinia: in valleys on the sides of mountains, *Schimper*, 734! 1079! Maigouagoua, *Quartin-Dillon*! and without precise locality, *Schimper*, 42! *Plowden*! British East Africa: Bongo; Kulungo, *Schweinfurth*, 2687! Addai, *Schweinfurth*, 2230! Moru District; Neangara, *Petherick*! Unyoro, *Speke & Grant*! Uganda, *Wilson*, 130!

Lower Guinea. Congo, *Smith*! *Burton*! Lower Congo; Bingila, *Dupuis*, Loango, *Soyaux*, 67! Angola, *Welwitsch*, 5627! 5690! 5741! *Monteiro*! *Johnston*!

Native name in Sierra Leone "Fetfettis."

7. **L. ? ukambensis**, *Vatke in Linnaea*, xliii. 528. An undershrub, with hispid branchlets, villous upwards. Leaves opposite, shortly petioled, ovate- or oblong-lanceolate, attenuate at the base, crenate, hispid on both sides, reaching a length of 2 in. Heads solitary, shortly peduncled, subglobose, finally oblong, $\frac{1}{2}$ in. long; bracts oblong, acuminate, longer than the corolla-tube.

Nile Land. British East Africa: Ukamba: Kitui, *Hildebrandt*, 2739.

8. **L. Burtonii**, *Baker*. An undershrub, with slightly bristly slender woody branchlets. Leaves in threes, sessile, oblong, crenate, rugose like those of *L. asperifolia*, scabrous above, densely pubescent, with raised veins beneath. Heads many from a node, very shortly peduncled, globose, $\frac{1}{3}$ in. diam.; bracts ovate, acuminate, very hairy, $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Corolla not longer than the bract.

→ **Lower Guinea.** Congo, *Burton*!

9. **L. plicata**, *Baker*. Branches woody, densely pubescent. Leaves opposite, shortly petioled, ovate, $1\frac{1}{2}$ –2 in. long, green on both surfaces, plicate, crenate, very scabrous above, densely pubescent beneath. Heads forming a terminal panicle, oblong, 1 – $1\frac{1}{2}$ in. long, above $\frac{1}{2}$ in. diam.; bracts ovate, acute, green, densely pubescent, $\frac{1}{6}$ in. long. Corolla-tube cylindrical, above $\frac{1}{8}$ in. long; lobes of the limb small, orbicular.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, *Carson*, 81 128!

4. **BOUCHEA**, Cham.; Benth. et Hook. f. Gen. Pl. ii. 1144.

Calyx cylindrical, 5-ribbed, 5-toothed, finally splitting down one side to the base. Corolla-tube long, slender, cylindrical; limb patent, oblique, with 5 short broad lobes. Stamens 4, didynamous, included in the corolla-tube; filaments short; anther-cells parallel. Ovary 2-celled; ovules usually solitary, erect from the base of the cells; style long, subulate; stigma capitate, bilobed. Fruit dry, included in the calyx-tube, oblong, separating into two pyrenes. Seed linear, exalbuminous. —Perennial herbs or undershrubs. Leaves opposite, sessile or petioled,

toothed. Inflorescence a long spike, each flower in the axil of a persistent bract.

Species about 16; in India, Tropical America and several at the Cape.

Calyx-teeth small.

Leaves petioled.

Capsule winged at the apex 1. *B. pterygocarpa*.

Capsule not winged at the apex.

Leaves pubescent, crenate 2. *B. marrubiifolia*.

Leaves glabrous, pinnatifid 3. *B. garepensis*.

Leaves sessile 4. *B. sessilifolia*.

Calyx-teeth large 5. *B. Hanningtoni*.

1. ***B. pterygocarpa***, Schauer in *DC. Prod.* xi. 558. A much-branched perennial herb. Stems clothed with short white pubescence. Leaves ovate, obtuse, deeply toothed, 1–1½ in. long, cuneate or subtruncate at the base, pubescent on both sides; petiole ½ in. long. End spikes 6–9 in. long, moderately dense, with all the flowers finally adpressed to the pubescent rhachis; bracts lanceolate, much shorter than the calyx. Calyx cylindrical, finely pubescent, ¼–½ in. long; teeth very minute. Corolla-tube about ½ in. long; limb ⅙ in. diam. Capsule linear-oblong, shorter than the calyx, with 2 pyrenes ending in an obtuse wing.—A. Rich. *Tent. Fl. Abyss.* ii. 166.

Nile Land. Nubia, *Bent!* Kordofan: Kohn Mountain, *Kotschy*, 230, *Meibes, Pfund*, 852! Abyssinia: Tigre; on hills near Adeganna, *Schimper*, 1012! mountains near Goelleb, 4000 ft., *Schimper*, 2210! and without precise locality, *Schimper*, 424.

Mozamb. Dist. German East Africa: Usambara; on the Steppe by the Pangani River, *Volkens*, 450!

2. ***B. marrubiifolia***, Schauer in *DC. Prod.* xi. 558. A much-branched perennial herb. Stems clothed with short white pubescence. Leaves ovate or suborbicular, obtuse, conspicuously crenate, pubescent on both sides, 1–1½ in. long, cuneate or subtruncate at the entire base; petiole ½–1 in. long. End-spikes ½ ft. long, moderately dense, with all the flowers adpressed to the pubescent rhachis; bracts lanceolate, much shorter than the calyx. Calyx ¼–½ in. long, densely and shortly pubescent; teeth very minute. Corolla-tube very slender, ½ in. long; limb ⅙ in. diam. Capsule shorter than the calyx, the pyrenes not produced into a wing at the apex.—C. B. Clarke in *Hook. f. Fl. Brit. Ind.* iv. 564.

Nile Land. Nubia: near Suakin at Hor Tamanib, *Lord*, 12! between Suakin and Berber, at Okurr, *Schweinfurth*, 466! and Wadi Abu-Kotod, *Schweinfurth*, 451! Kordofan: near Abu Gerad, *Kotschy*, 32! Wadi Taiarah, *Pfund*, 850! Om Marba, *Pfund*, 172! and without precise locality, *Kotschy*, 113! 213!

Also in Arabia and Scinde.

3. ***B. garepensis***, Schauer in *DC. Prod.* xi. 560, var. **microphylla**, O. Kuntze in *Jahrb. Königl. bot. Gart. Berl.* iv. 271. A glabrous erect perennial herb. Leaves shortly petioled, ovate, ½ in. long, deeply pinnatifid. Racemes 1 or few, dense, terminal, cylindrical, ½–1 ft.

long; bracts linear, rigid; pedicels short, ascending. Calyx finally $\frac{1}{4}$ in. long, toothed, splitting down one side to the base. Corolla-tube long, cylindrical; limb $\frac{1}{8}$ in. long. Capsule obtuse, $\frac{1}{8}$ in. long, tetragonal, not winged, black.

Lower Guinea. German South-West Africa: Hereroland, *Pechuel-Loesche*.

The typical form is South African.

4. **B. sessilifolia**, *Vatke in Linnæa*, xliii. 529. Stems clothed with short whitish pubescence. Leaves sessile, firm, obovate-cuneate, above $\frac{1}{2}$ in. long, sharply toothed in the upper half, slightly hairy on both sides. Spike slender, moderately dense, about $\frac{1}{2}$ ft. long; bracts small, ovate, acuminate. Calyx $\frac{1}{4}$ in. long; teeth very minute. Corolla-tube 1 in. long; limb $\frac{1}{4}$ in. diam. Capsule shorter than the calyx.—*Engl. Hochgebirgsfl. Trop. Afr.* 355.

Nile Land. Somaliland: Adda Galla, *James & Thrupp!* Ahl Mountains at Yafir, 6500 ft., *Hildebrandt*, 855A.

5. **B. Hanningtoni**, *Oliv. in Hook. Ic. Pl. t.* 1446. Branches tetragonal, shortly pubescent. Leaves oblanceolate-oblong, subsessile, subacute, rigidly subcoriaceous, 1–1 $\frac{1}{2}$ in. long, inciso-crenate above the base, slightly hairy on both sides. End spike $\frac{1}{2}$ ft. long, dense in the upper half, lax in the lower; bracts ovate, acuminate, much shorter than the calyx. Calyx slender, $\frac{1}{2}$ in. long, strongly 5-ribbed, clothed with ascending whitish bristly hairs; teeth large, lanceolate. Corolla-tube curved, very slender, 1 $\frac{1}{2}$ in. long; limb $\frac{1}{2}$ in. diam. Capsule not seen.

Mozamb. Dist. German East Africa, *Hannington!*

5. **STACHYTARPHETA**, *Vahl; Benth. et Hook. f. Gen. Pl. ii.* 1145.

Calyx long, cylindrical, 5-ribbed, 5-toothed, often variously slit in a late stage. Corolla-tube slender, cylindrical; limb patent, with 5 orbicular equal or unequal lobes. Perfect stamens 2 (the anticus pair) included in the corolla-tube; anther-cells divaricate; staminodia 2, minute. Ovary 2-celled; ovules solitary, attached laterally near the base of the cells; style long, filiform; stigma capitate. Fruit cylindrical, separating into two long narrow truncate pyrenes. Seeds linear, exalbuminous.—Herbs or undershrubs. Leaves usually opposite, petioled, toothed. Inflorescence a long spike, with the rhachis usually thickened and hollowed out so as to form a cavity in which the flowers are immersed; bracts lanceolate, rigid, persistent. Corolla blue, red or white.

Species about 40, mostly Tropical American.

Rhachis not hollowed out opposite the flowers 1. *S. Hildebrandtii*.

Rhachis hollowed out opposite the flowers.

Corolla-limb small, blue.

Leaves oblong-lanceolate, acute 2. *S. angustifolia*.

Leaves oblong, obtuse 3. *S. indica*.

Corolla-limb larger, red 4. *S. mutabilis*.

1. **S. Hildebrandtii**, *Vatke in Linnæa*, xliii. 529. A much-branched perennial herb. Stems terete, pilose. Leaves opposite, oblong, obtuse, distinctly petioled, crenate, cuneate at the base, 1–1½ in. long, hairy on both sides. Spikes 6–9 in. long, with a slender hairy tetragonal rhachis, not hollowed out opposite the flowers; bracts lanceolate, the lower ¼ in. long. Calyx 4-ribbed, pilose, ½ in. long; teeth minute. Corolla-tube twice as long as the calyx; limb milk-white, ¼ in. diam. Capsule not seen.

Nile Land. British East Africa: Ukamba; Kitui, *Hildebrandt*, 2737!

2. **S. angustifolia**, *Vahl; Schauer in DC. Prod.* xi. 563. A much-branched annual with tetragonal nearly or quite glabrous stems. Leaves opposite, distinctly petioled, oblong-lanceolate, acute, glabrous, deeply inciso-crenate, 2–3 in. long. Spikes very slender, 6–9 in. long, with the glabrous tetragonal rhachis ½ in. diam., hollowed out opposite the flowers; bracts lanceolate, acuminate, ¼–½ in. long. Calyx nearly as the bract; teeth minute. Corolla-tube twice as long as the calyx; limb small, blue. Capsule shorter than the calyx.—*Verbena indica*, *Jacq. Obs.* iv. 7, t. 86, non Linn.

Upper Guinea. Senegambia, *Berlin Herbarium*. Dagomba: Salaga, *Krause!* Niger Territory: Nupe; Jeba on the Niger, *Barter!* Cameroons: Rio del Rey, *Johnston!*

Lower Guinea. Angola, *Welwitsch*, 5640! 5652!

South Central. Congo Free State; Monbuttu; by the River Kibali, *Schweinfurth*, 2535! Mtowa, on Lake Tanganyika, *Descamps*.

Also in Tropical America.

3. **S. indica**, *Vahl; Schauer in DC. Prod.* xi. 564. A much-branched annual, 2–3 ft. high, with terete nearly glabrous stems. Leaves opposite, distinctly petioled, oblong, obtuse, deeply crenate, cuneate at the base, 2–3 in. long. Spikes ½–1 ft. long; rhachis ⅙ in. diam., conspicuously hollowed out opposite the flowers; bracts lanceolate, acuminate, ¼ in. long. Calyx rather shorter than the bract; teeth minute. Corolla-tube slightly longer than the calyx; limb ¼ in. diam., blue, with a white eye. Capsule rather shorter than the calyx.—*Vatke in Linnæa*, xliii. 530; C. B. Clarke in *Hook. f. Fl. Brit. Ind.* iv. 564. *S. jamaicensis*, *Vahl ex Schauer*, loc. cit.; *Benth. in Hook. Niger Fl.* 484.

Upper Guinea. Sierra Leone, *Scott-Elliott*, 3833! 4162! Gold Coast: Cape Coast Castle, *Vogel*, 30! Dahomey, *Burton!* Lagos, *Millen!* Fernando Po, *Mann*, 89!

Lower Guinea. Lower Congo: Stanley Pool, *Hens*, 83! Congo, *Smith!*

Mozamb. Dist. Zanzibar, *Hildebrandt*, 997!

Also in Tropical Asia and America.

4. **S. mutabilis**, *Vahl; Schauer in DC. Prod.* xi. 565. Stems stouter than in *S. indica*. Leaves opposite, petioled, ovate- or oblong-lanceolate, acute, crenate, 2–4 in. long. Spikes ½–1 ft. long, finally ¼ in. diam.; rhachis stout, hairy, hollowed out opposite the flowers; bracts lanceolate, cuspidate, pubescent, ⅓–½ in. long. Calyx ⅓–½ in.

long, pubescent; teeth minute. Corolla-tube nearly twice as long as the calyx, dilated at the throat; limb red, $\frac{1}{3}$ – $\frac{1}{2}$ in. diam. Capsule shorter than the calyx, cylindrical, glabrous.

Lower Guinea. Angola, *Welwitsch*, 5631! 5649! 5716! 5764!

A native of Tropical America, now widely spread in the Old World.

6. **PRIVA**, Adans.; Benth. et Hook. f. Gen. Pl. ii. 1145.

Calyx at first cylindrical, with 5 ribs produced into small teeth, dilated as the fruit ripens, and closely investing it, the throat still remaining small. Corolla-tube cylindrical, slightly dilated upwards; limb patent, oblique, bilabiate. Stamens 4, didynamous, included in the corolla-tube; filaments short; anther-cells divaricate. Ovary 4-celled; cells 1-ovuled; style filiform; stigma oblique, with an angle or tooth at the back. Fruit included in the dilated calyx, separating into two bony pyrenes, each with 2 ovules. Seeds subterete, exalbuminous.—Erect, glabrous or pubescent herbs. Leaves opposite, petioled, membranous, toothed. Spikes long, lax, terminal; bracts small. Flowers inconspicuous.

Species about 9. Cosmopolitan in the warmer regions of both hemispheres.

1. **P. leptostachya**, *Juss.*; *Schauer in DC. Prod.* xi. 533. A much-branched perennial herb, with slender square hairy branches. Leaves opposite, ovate, membranous, hairy, crenate, acute or obtuse, 1–3 in. long. Spikes $\frac{1}{2}$ –1 ft. long, with lax flowers and a slender square rhachis; flowers ascending; fruits spreading or deflexed, sometimes obscurely pedicellate; bracts small, lanceolate. Flower-calyx hairy, cylindrical, $\frac{1}{4}$ in. long, globose in the fruiting stage, $\frac{1}{6}$ in. diam. Corolla-tube twice as long as the calyx; limb $\frac{1}{4}$ in. diam., white. Pyrenes bony, globose, muricate on the back, with a large hollow in the centre between them.—C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 565; Gürke in Engl. Pfl. Ost-Afr. C. 338. *P. dentata*, *Juss.*; *Schauer*, loc. cit.; A. Rich. Tent. Fl. Abyss. ii. 165; Schweinf. Beitr. Fl. Aethiop. 120. *P. abyssinica*, *Jaub. & Spach*, *Illust. Pl. Orient*, t. 453–4; Franchet, Sert. Somal. 50. *P. Forskalii*, *Jaub. & Spach*, loc. cit. t. 455.

Nile Land. Nubia: Coast region, *Bent!* between Suakin and Berber in Wady O-Mareg, *Schweinfurth*, 433! near Suakin at Gebel Uaratab, *Schweinfurth*, 54! Eritrea: near Saati, *Schweinfurth & Riva*, 490! Keren, *Steudner*, 1301! Abyssinia: Tigre; near Aguar, *Schimper*, 1023! Somaliland, *Révoil*. British East Africa: Kikumbuliyu, *Scott-Elliott*, 6217! Ukamba (ex *Gürke*).

Mozamb. Dist. German East Africa! West of the Pare Range, 600–2300 ft., *Höhnel*; Kilimanjaro; below Marangu, 3000 ft., *Volkens*, 2154! Portuguese East Africa: Lower Zambesi; Shupanga, *Kirk!* 225! British Central Africa: Nyasaland; Plain of Zomba, 2500–3000 ft., *Whyte!* Shire Highlands, *Buchanan!*

Also in South Africa, Socotra and India.

7. **VERBENA**, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1146.

Calyx tubular, 5-ribbed, 5-toothed, little changed in the fruiting stage. Corolla-tube subcylindrical, straight or curved; limb patent, subbilabiate, 5-lobed. Stamens usually 4, didynamous, included in the corolla-tube; filaments short, filiform; anther-cells parallel or slightly divergent. Ovary 4-celled; cells 1-ovuled; ovules attached laterally near the base of the cells; style usually short, 2-lobed at the apex. Fruit dry, oblong, about as long as the calyx-tube, separating into 4 narrow pyrenes. Seed erect, albuminous.—Herbs or undershrubs. Leaves usually opposite and toothed or more deeply cut. Inflorescence spicate; bracts solitary. Flowers small or medium-sized, inconspicuous or showy.

Species about 80, mostly American.

- | | |
|---|----------------------------|
| Annual. Leaves bipinnatifid | 1. <i>V. supina</i> . |
| Perennial. Leaves simply pinnatifid | 2. <i>V. officinalis</i> . |

1. ***V. supina***, Linn.; Schauer in DC. Prod. xi. 548. Annual, densely pubescent. Stems much-branched from the base. Leaves deltoid, cuneate at the base, bipinnatifid; final segments oblong. Spikes at first dense; lower bracts lanceolate, as long as the calyx. Calyx $\frac{1}{2}$ in. long; teeth minute. Corolla lilac; tube twice as long as the calyx; limb $\frac{1}{2}$ in. diam. Capsule as long as the calyx.—Schweinf. Beitr. Fl. Aethiop. 120; Sibth. & Sm. Fl. Græc. t. 554.

Nile Land. Nubia, Ehrenberg, Khartum, Kotschy, 323! Schweinfurth, 878! Kordofan: near Sodari, Pfund, 180! Upper Sennar: Fazokl, Cienkowsky, Kotschy, 265! Spread through the Mediterranean region.

2. ***V. officinalis***, Linn.; Schauer in DC. Prod. xi. 547. Perennial. Stems erect, nearly or quite glabrous. Leaves rhomboid-ovate, subglabrous, usually deeply pinnatifid. Spikes very lax and slender, forming a terminal panicle; bracts lanceolate, the lower as long as the calyx. Calyx $\frac{1}{2}$ in. long; teeth minute. Corolla lilac; tube twice as long as the calyx; limb $\frac{1}{6}$ in. diam.—A. Rich. Tent. Fl. Abyss. ii. 165; Schweinf. Beitr. Fl. Aethiop. 120; Engl. Hochgebirgsfl. Trop. Afr. 355; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 565; Franchet, Sert. Somal. 50; Gürke in Engl. Pfl. Ost-Afr. C. 337.

Nile Land. Eritrea: Habab, Hildebrandt, 445, Haühello Kokob, at the north of Acrur, 5200 ft., Schweinfurth & Riva, 1116! Ainsaba, Steudner, 1304! Abyssinia: near Adowa, Schimper, 145! near Addi Abun, Schimper, 7; near Delhi Dikeno, Schimper, 284; Shire, Quartin-Dillon; and at Godofelassi, Rohlf's & Steker. Sennar, Cienkowsky. British East Africa: Ruwenzori; Wimi Valley, 6000 ft., Scott-Elliott, 7800! Somaliland, Révoil.

Mozamb. Dist. German East Africa: Karagwe; Buboba (ex Gürke); Usmawo; Kageyi on Lake Victoria (ex Gürke).

Spread through the north temperate zone in the Old World, and extending to South Africa, introduced in America.

V. bonariensis, Linn., Schauer in DC. Prod. xi. 541, with deeply incised scabrous

simple leaves and dense spikes, a native of Extratropical South America, is now established at the Cape and in Mauritius, Bombay, Madagascar, and the Canary Isles, but we have no specimens from Tropical Africa.

8. **DURANTA**, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1150.

Calyx subcylindrical; teeth 5, minute. Corolla-tube cylindrical; lobes 5, spreading, short, obtuse, unequal. Stamens 4, didynamous, included in the corolla-tube; anther-cells parallel. Ovary 8-celled; cells 1-ovuled; style short; stigma oblique, dilated, 4-lobed. Drupe enclosed in the accrescent calyx; pyrenes 4, 2-celled. Seeds exalbuminous.—Shrubs, unarmed or spinous. Leaves opposite or verticillate, entire or toothed. Flowers racemose.

Species 4–5, wild only in Tropical America.

1. **D. Plumieri**, Jacq.; *Schauer in DC. Prod.* xi. 615. A shrub 5–10 ft. high, with glabrous or finely pubescent branchlets, unarmed or spinous. Leaves opposite, distinctly petioled, oblong, acute or obtuse, entire or inciso-crenate. Flowers in copious long terminal racemes; bracts linear. Flower-calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Corolla bright lilac, more than twice as long as the calyx; lobes suborbicular, pubescent inside; expanded limb $\frac{1}{4}$ – $\frac{1}{3}$ in. diam. Drupe yellow, the size of a pea, much shorter than the closed accrescent calyx.—Bot. Reg. t. 244; Gürke in Engl. Pfl. Ost-Afr. C. 338. *D. repens* and *D. erecta*, Linn. Sp. Pl. ed. i. 637.

Upper Guinea. Sierra Leone: Sherboro Island, *Garrett in Herb. Scott-Elliot*, 4846! 5853! Waterloo, *Kirk!* and without precise locality, *Barter!* Lagos, *Moloney!* Niger Territory: Old Calabar River, *Kalbreyer*, 209!

Nile Land. British East Africa: Niamniam; by the Atasilli Brook, *Schweinfurth*, 3154!

Lower Guinea. Angola, *Welwitsch*, 5760!

South Central. Congo Free State: Monbuttu; Munza, *Schweinfurth*, 3456!

Mozamb. Dist. Lake region: Ukira and Issanjo (ex *Gürke*).

A native of Tropical America, now widely spread in the Old World.

9. **PREMNA**, Linn.; Benth. et Hook. f. Gen. Pl. ii. 1152.

Flowers hermaphrodite or polygamous. Calyx small, campanulate, truncate or shortly 2–5-lobed, accrescent. Corolla-tube short, subcylindrical; limb patent, with 4 orbicular equal or subequal lobes. Stamens 4, didynamous, inserted in the corolla-tube, more or less exerted from the tube; filaments filiform; anthers ovoid or subglobose; cells parallel or divergent. Ovary 2-celled or spuriously 1-celled; ovules 4, attached to the side of the cells; style subulate, shortly bifid at the stigmatose apex. Drupe small, globose; mesocarp thin, fleshy; endocarp hairy.—Shrubs or trees, sometimes scandent, with glabrous or hairy branchlets. Leaves 2–4-nate, entire or dentate, often dotted

with resinous glands. Cymes forming a corymbose or thyrsoid panicle. Flowers minute, whitish or greenish.

Species 40 or more, inhabiting the warmer regions of the Old World, many of them Indian.

Inflorescence thyrsoid.

Leaves 2 to a node, opposite.

Leaves obtuse 1. *P. ferruginea*.

Leaves acuminate 2. *P. longipes*.

Leaves 4 to a node.

Branchlets and leaves glabrous 3. *P. angolensis*.

Branchlets and leaves pubescent 4. *P. quadrifolia*.

Inflorescence corymbose.

Corymb small.

Calyx-teeth minute, broadly deltoid 5. *P. resinosa*.

Calyx-teeth large, oblong 6. *P. somaliensis*.

Corymb ample.

Corolla-tube twice as long as the calyx.

Stamens overtopping the corolla-lobes 7. *P. macrosiphon*.

Stamens not overtopping the corolla-lobes.

Leaves glabrous beneath 8. *P. serratifolia*.

Leaves hairy beneath 9. *P. hispida*.

Corolla-tube scarcely longer than the calyx.

Leaves glabrous beneath.

Leaves oblong.

Calyx-teeth small 10. *P. Milnei*.

Calyx-teeth large 11. *P. macrodonta*.

Leaves cordate-ovate 12. *P. Holstii*.

Leaves pubescent beneath.

Climber 13. *P. Hildebrandtii*.

Erect shrubs or small trees.

Pubescence ferruginous 14. *P. velutina*.

Pubescence grey.

Calyx-teeth minute.

Bracts ovate 15. *P. viburnoides*.

Bracts linear-subulate 16. *P. senensis*.

Calyx-teeth as long as the tube 17. *P. oligotricha*.

1. ***P. ? ferruginea***, *A. Rich. Tent. Fl. Abyss.* ii. 172. Branchlets tetragonal, clothed with fulvous tomentum. Leaves opposite, petioled, ovate, obtuse, crenate, hairy on both surfaces. Inflorescence a lax thyrsoid panicle; flowers subsessile. Calyx very short; lobes 5, acute. Corolla-tube pubescent, as long as the calyx; limb 5-lobed. Stamens exerted from the corolla-tube.

Nile Land. Abyssinia: Shire, *Quartin-Dillon*.

2. ***P. longipes***, *Baker*. An erect shrub, with slender terete pubescent branchlets. Leaves opposite, distinctly petioled, oblong, acuminate, cuneate at the base, 3-4 in. long, crenate, membranous, slightly pubescent above, densely pubescent beneath. Inflorescence a lax thyrsoid terminal panicle 3-4 in. long; branches pubescent; pedicels reaching $\frac{1}{2}$ in. long; bracts minute, ovate, acuminate. Calyx cylindrical, densely pubescent, $\frac{1}{8}$ in. long; teeth minute, deltoid. Corolla-

tube scarcely longer than the calyx; lobes small. Stamens included. Style much exserted.

Mozamb. Dist. British Central Africa: Nyasaland, *Buchanan!*

3. **P. angolensis**, *Gürke in Engl. Jahrb.* xviii. 165. A shrub 16 ft. high, with glabrous branchlets. Leaves 2-4-nate, ovate or sub-orbicular, entire, shortly cuspidate, rounded or cordate at the base, sometimes 5-6 in. long, glabrous on both surfaces. Inflorescence a long thyrsoid panicle; primary branches dichotomous; ultimate branchlets finely pubescent, bearing very dense clusters of flowers; pedicels very short. Flower-calyx $\frac{1}{2}$ in. long; lobes obscure, minute. Corolla-tube slightly longer than the calyx; lobes 4, unequal. Stamens reaching to the tip of the corolla-lobes.

Lower Guinea. Angola, *Welwitsch*, 5628! 5724! Loango, *Soyaux*, 159! Majakalla country, *Mechow*, 527.

4. **P. quadrifolia**, *Schumacher & Thonn.*; *Schauer in DC. Prod.* xi. 633. An erect shrub, with shortly pubescent branchlets. Leaves ovate or oblong, some 4-nate, cuspidate, entire or obscurely crenate, 2-4 in. long, rounded or cordate at the base, finely pubescent on both surfaces; petiole long. Cymes forming a thyrsoid panicle; branchlets pubescent; bracts lanceolate, minute; pedicels very short. Flower-calyx $\frac{1}{8}$ - $\frac{1}{2}$ in. long, pubescent; lobes very short and obscure. Corolla-tube longer than the calyx; lobes 4, unequal. Stamens shortly exserted from the corolla-tube.—*Benth. in Hook. Niger Fl.* 485.

Upper Guinea. Guinea: near Fredriksberg, *Thonning*. Lagos: Abeokuta, *Barter*, 3358! Niger Territory, *Vogel!*

5. **P. resinosa**, *Schauer in DC. Prod.* xi. 637. An erect shrub with slender white glabrous or slightly pubescent branchlets. Leaves of the flowering shoots petioled, ovate or oblong, entire, obtuse, $\frac{1}{2}$ - $1\frac{1}{2}$ in. long, glabrous or obscurely pubescent beneath, of the sterile shoots sometimes crenate. Panicle small, terminal, peduncled, corymbose; pedicels glabrous or pubescent; bracts ovate, minute. Calyx campanulate, $\frac{1}{2}$ in. long, glabrous or pubescent; teeth small, broadly deltoid. Corolla-tube scarcely longer than the calyx; limb bilabiate; lobes orbicular. Stamens and style included. Drupe black, the size of a small pea.—*Holochiloma resinosum*, *Hochst. in Flora*, 1841, 371.

Nile Land. Nubia: Coast Region, *Bent!* near Suakin, at Gebel Uaratab, *Schweinfurth*, 53! between Suakin and Berber, at Singat, *Schweinfurth*, 330! and at Wady O-Mareg, *Schweinfurth*, 431! Eritrea: near Saati, *Schweinfurth & Riva*, 305! Kordofan: Mount Arashkol, *Kotschy*, 198! near Melbes, *Kotschy*, 414! Abu Haraza, *Pfund*, 132! Abu Snun, *Pfund*, 328! Wadi Taiarah, *Pfund*, 846! between El Obeid and Melbes, *Pfund*, 848! and without precise locality, *Kotschy*, 254!

Also in Arabia.

6. **P. somaliensis**, *Baker*. An erect shrub, 10 ft. high, with slender woody glabrous branchlets. Leaves distinctly petioled, ovate, $1-1\frac{1}{2}$ in. long, obtuse, obscurely crenate, turning black when dried,

obscurely pubescent beneath. Corymbs small, terminal, peduncled; branchlets slightly pubescent; pedicels as long as the calyx; bracts ovate, sinuate. Calyx campanulate, glabrous, $\frac{1}{2}$ in. long; teeth oblong, obtuse, $\frac{1}{3}$ the length of the tube. Corolla-tube not longer than the calyx; limb small, bilabiate; lobes orbicular. Stamens and style included.

Nile Land. Somaliland: Ahi Mountains near Maid, 1500 ft., *Hildebrandt*, 1526!

7. ***P. macrosiphon***, *Baker ex Henriques in Bolet. Soc. Brot.* x. 148. A climber reaching to a height of 20 ft., with woody pubescent branchlets. Leaves opposite or ternate, oblong, cuspidate, entire, 3–6 in. long, 2–3 in. broad, subcoriaceous, glabrous above, nearly or quite glabrous beneath when mature; petiole long, pubescent. Panicle short, dense, ample, corymbose, with pubescent branchlets; bracts large, linear. Calyx $\frac{1}{6}$ in. long; lobes ovate, as long as the tube. Corolla-tube slender, longer than the calyx-teeth; lobes obovate, unequal. Stamens and style much exerted from the corolla-tube, overtopping the lobes.

Upper Guinea. Old Calabar, *Thomson*, 28! Cameroon River, *Mann*, 2213! Fernando Po, *Mann*, 486!

Lower Guinea. Island of St. Thomas, *Quintas*!

8. ***P. serratifolia***, *Linn.*; *Schauer in DC. Prod.* xi. 632. An erect shrub, with glabrous branchlets. Leaves opposite, oblong, long-petioled, crenate or entire (*P. integrifolia*, *Linn.*; *Wight, Ic.* t. 1469), 3–6 in. long, subcoriaceous, glabrous on both surfaces. Panicle dense, ample, corymbose, with finely pubescent branchlets; bracts lanceolate. Flower-calyx $\frac{1}{2}$ in. long, obscurely bilabiate. Corolla-tube twice as long as the calyx; lobes 4, unequal, greenish-white. Stamens not exerted beyond the corolla-lobes. Drupe purple, the size of a small pea.

Mozamb. Dist. German East Africa: Rovuma River, *Kirk*! Portuguese East Africa: Zambesi Delta; Kongoni River, *Kirk*, 328! West Luabo River, *Kirk*!

Also in Tropical Asia and the Mascarene Islands.

9. ***P. hispida***, *Benth. in Hook. Niger Fl.* 485. A small tree, with densely pilose branchlets. Leaves opposite, oblong, acute, entire, 3–8 in. long by half as broad, cuneate at the base, thinly pubescent above, densely pubescent beneath; petiole short, stout, hairy. Panicle short, dense, corymbose, with very hairy branchlets; pedicels very short. Flower-calyx very hairy, $\frac{1}{2}$ in. long; teeth 5, deltoid, distinct. Corolla-tube cylindrical, twice as long as the calyx; limb bilabiate. Stamens not exerted beyond the corolla-lobes. Drupe globose, $\frac{1}{8}$ in. diam.

Upper Guinea. Senegambia, *Heudelot*, 760! Sierra Leone: Sugarloaf Mountain, *Barter*! in forest by the River Scarcies, *Scott-Elliot*, 4521! Sherboro Island, *Garrett in Herb. Scott-Elliot*, 5833! North-east of Sierra Leone, *Garrett*, 16! and without precise locality, *Don*!

10. **P. Milnei**, *Baker*. Branchlets glabrous. Leaves opposite, oblong, acute, entire, 2–3 in. long, 1 in. broad, distinctly petioled, subcoriaceous, glabrous on both sides. Panicle lax, corymbose, with slender pubescent branchlets; pedicels short; bracts lanceolate. Flower-calyx turbinate, $\frac{1}{8}$ in. long, shortly pubescent; teeth deltoid, minute. Corolla-tube not longer than the calyx; lobes very small. Stamens not exerted beyond the corolla-lobes.

Upper Guinea. “Fernando Po and vicinity,” *Milne!*

11. **P. macrodonta**, *Baker*. An erect shrub, 6 ft. high, with glabrous branchlets. Leaves long-petioled, oblong, 2–3 in. long, cuneate at the base, entire, subcoriaceous, green and glabrous on both surfaces. Cymes terminal, ample, moderately dense; pedicels short, glabrous; bracts deciduous. Mature calyx glabrous, $\frac{1}{8}$ in. long; teeth ovate, longer than the tube. Corolla not seen. Immature drupe globose, as long as the calyx. Style $\frac{1}{8}$ in. long.

Nile Land. British East Africa: Mombasa, on dry coral, *Scott-Elliot*, 6106!

12. **P. Holstii**, *Gürke in Engl. Pfl. Ost-Afr. C.* 338. An erect shrub, with slender pubescent branchlets. Leaves shortly petioled, cordate-ovate, 1–2 in. long, cuspidate, entire, moderately firm, green and glabrous on both surfaces. Cymes dense, terminal; pedicels short, pubescent; bracts minute. Flower-calyx pubescent, $\frac{1}{2}$ in. long; teeth short, obtuse. Corolla-tube as long as the calyx; lobes unequal, oblong, obtuse, half as long as the tube. Stamens not exerted beyond the corolla-lobes.

Mozamb. Dist. German East Africa: Usaramo; Dar-es-Salaam, *Stuhlmann*. Usambara; Muoa, *Holst*, 3079!

13. **P. Hildebrandtii**, *Gürke in Engl. Jahrb.* xviii. 165. A tall climbing shrub, with slender densely pubescent branchlets. Leaves long-petioled, broadly ovate, 3–4 in. long, cuspidate, entire, broadly rounded or subcordate at the base, membranous, grey-green and densely pubescent on both surfaces. Cymes dense, ample, terminal; pedicels short, densely pubescent; bracts subulate. Flower-calyx $\frac{1}{2}$ in. long, densely pubescent; teeth very small, ovate. Corolla-tube not longer than the calyx; lobes small, oblong, obtuse.

Nile Land. British East Africa; Mombasa Island, *Hildebrandt*, 2008!

14. **P. velutina**, *Gürke in Engl. Pfl. Ost-Afr. C.* 338. An erect shrub; branchlets clothed with ferruginous hairs. Leaves shortly petioled, ovate, 2–3½ in. long, rounded or subcordate at the base, acute or shortly cuspidate, pilose only on the main ribs above, velvety all over beneath. Cymes dense, terminal. Calyx-teeth 5, unequal, 2 broad and obtuse, 3 narrower and subacute. Corolla-tube slightly longer than the calyx; lobes 4, unequal. Drupe globose, black.

Mozamb. Dist. German East Africa: Usaramo, *Stuhlmann*, 6692, 7176.

15. ***P. viburnoides***, *A. Rich. Tent. Fl. Abyss*, ii. 171. An erect shrub, with densely pubescent branchlets. Leaves distinctly petioled, ovate, 2–3 in. long, obtusely cuspidate, entire, broadly rounded or subcordate at the base, nearly glabrous above when mature, pubescent beneath. Cymes dense, many-flowered, terminal; pedicels short, densely pubescent; bracts small, ovate. Calyx pubescent, campanulate, $\frac{1}{2}$ in. long; teeth short, usually obtuse. Corolla-tube as long as the calyx; lobes oblong, obtuse, rather shorter than the tube. Stamens not exerted beyond the corolla-lobes. Drupe globose, glabrous, black, $\frac{1}{8}$ in. diameter.—*P. Schimperi*, *Engl. Hochgebirgsfl. Trop. Afr.* 356.

Nile Land. Abyssinia: Tigre; at Addi Gayechti in Debra Damo District, 6800 ft., *Schimper*, 566! Begemeder; in the Valley of the Reb at Gerra-Abuna-Tekla-Haimanot, 7500–8500 ft., *Schimper*, 1131! Shoa, *Petit*, Ankober, *Roth*, 466!

Mozamb. Dist. German East Africa: Unyamwezi, 3900 ft., *Speke & Grant!* Portuguese East Africa: Lower Shire Valley, *Kirk!*

16. ***P. senensis***, *Klotzsch in Peters, Reise Mossamb. Bot.* 263. A small tree, with densely pubescent branchlets. Leaves shortly petioled, ovate or oblong, 1–2 in. long, acute, entire, rounded or cuneate at the base, thinly pubescent above, densely pubescent and grey beneath. Cymes dense, terminal, many-flowered; pedicels very short, densely pubescent; bracts subulate. Calyx densely pubescent, $\frac{1}{8}$ in. long; teeth short, obtuse. Corolla-tube rather longer than the calyx; lobes ovate, obtuse, shorter than the tube. Stamens reaching to the tip of the corolla-lobes; filaments hairy at the base.

Mozamb. Dist. Portuguese East Africa; Lower Zambesi; Lupata, *Kirk!* British Central Africa; Nyasaland, *Buchanan*, 93! 1261!

The natives procure their fire-sticks from this species.

17. ***P. oligotricha***, *Baker*. An erect shrub, with slender slightly pubescent branchlets. Leaves shortly petioled, suborbicular, 1–1½ in. long, subcuneate or rounded at the base, cuspidate, distinctly crenate, membranous, nearly glabrous above, pubescent beneath. Cymes small, lax, terminal; pedicels as long as the calyx. Calyx $\frac{1}{2}$ in. long; lobes ovate, acute, unequal, as long as the campanulate tube. Corolla-tube rather shorter than the calyx; limb bilabiate, as long as the tube. Stamens shorter than the corolla-lobes.

Nile Land. British East Africa; Taita; Ndi Mountains, *Scott-Elliot*, 6202!

10. CLERODENDRON, Linn.; Benth. et Hook. f. *Gen. Pl.* ii. 1155.

Calyx not accrescent; tube campanulate; lobes 5, equal, longer or shorter than the tube. Corolla-tube cylindrical; lobes 5, obovate, spreading or slightly reflexed, subequal or unequal. Stamens 4, inserted below the throat of the corolla-tube; filaments long, filiform, involute in bud; anthers ovoid or oblong, with parallel cells. Ovary imperfectly 4-celled; cells 1-ovuled; style long, bifid at the apex. Fruit a globose drupe with a fleshy pericarp and 4 smooth or rugose pyrenes. Seed oblong, exalbuminous.—Trees or shrubs, sometimes scandent. Leaves

opposite, rarely ternately verticillate, entire or toothed. Cymes axillary or terminal, lax or dense. Flowers small or large, various in colour.

Species about 100, concentrated in the warmer regions of the Old World, a few American.

*EU-CLERODENDRON. Corolla-tube short; segments of the limb subequal, flat.

Cymes capitate.

Corolla-tube $\frac{3}{4}$ –1 in. long.

Leaves often 3–4-nate 1. *C. acerbianum*.

Leaves always opposite 2. *C. sinuatum*.

Corolla-tube 1–1 $\frac{1}{2}$ in. long.

Herbaceous 3. *C. eupatorioides*.

Fruticose.

Leaves glabrous.

Calyx-teeth small 4. *C. Schweinfurthii*.

Calyx-teeth not small 5. *C. Bakeri*.

Leaves hairy 6. *C. conglobatum*.

Cymes not capitate. Flowers small.

†Leaves oblong.

Leaves glabrous.

Bases of old petioles indurated and persistent 7. *C. kentrocaule*.

Bases of old petioles not indurated.

Inflorescence small 8. *C. glabrum*.

Inflorescence a large compact thyrsoïd panicle 9. *C. volubile*.

Inflorescence a large subumbellate panicle 10. *C. Formicarum*.

Leaves slightly pubescent beneath

Inflorescence small, compact.

Leaves small 11. *C. ovale*.

Leaves large 12. *C. Barteri*.

Inflorescence a large thyrsoïd panicle 13. *C. toxicarium*.

Leaves densely pubescent beneath.

Leaves entire 14. *C. tanganyikense*.

Leaves deeply crenate 15. *C. Kirkii*.

††Leaves ovate, rounded at the base.

Leaves glabrous.

Leaves 2–3 in. long 16. *C. Melanocrater*.

Leaves 3–6 in. long 17. *C. silvæanum*.

Leaves very pubescent 18. *C. eriophyllum*.

†††Leaves cordate-ovate.

Calyx $\frac{1}{8}$ in. long 19. *C. polycephalum*.

Calyx $\frac{1}{6}$ in. long 20. *C. Johnstoni*.

Calyx $\frac{1}{4}$ in. long 21. *C. syringæfolium*.

Cymes not capitate. Flowers large.

†Leaves oblong.

Leaves glabrous.

Flowers bright red 22. *C. splendens*.

Flowers white 23. *C. Buchholzii*.

Leaves pubescent

Leaves narrowed to the base 24. *C. harnierianum*.

Leaves rounded at the base

Petiole short 25. *C. congense*.

Petiole long 26. *C. Dinklagei*.

Leaves cordate 27. *C. Buettneri*.

††Leaves ovate, rounded at the base.

Leaves glabrous.

Calyx not inflated.

Leaves more or less acuminate.

Leaves coriaceous 28. *C. Giletii*.Leaves thin 29. *C. Preussii*.Leaves obtuse or rounded 30. *C. Hildebrandtii*.Calyx inflated 31. *C. Thomsonæ*.

Leaves more or less pubescent.

Petiole short.

Leaves finely pubescent 32. *C. Holstii*.Leaves velvety on both sides 33. *C. tricholobum*.Petiole moderately long 34. *C. pleiosciadium*.Petiole very long 35. *C. longipetiolatum*.

†††Leaves cordate-ovate.

Calyx finely pubescent.

Calyx inflated 36. *C. scandens*.Calyx not inflated 37. *C. cordifolium*.Calyx clothed with brown hairs 38. *C. fuscum*.

**SIPHONANTHUS. Corolla-tube long ; segments of the limb subequal, flat

Inflorescence capitate.

Leaves obovate-lanceolate 39. *C. Buchneri*.

Leaves oblong.

Corolla-tube 2-2½ in. long 40. *C. strictum*.Corolla-tube 3-4 in. long 41. *C. capitatum*.Corolla-tube 4-5 in. long 42. *C. Fischeri*.

Leaves cordate-ovate.

Leaves thin 43. *C. hysteroanthum*.Leaves subcoriaceous 44. *C. megasepalum*.

Leaves obovate-cuneate.

Leaves 3-4 in. long 45. *C. cuneifolium*.Leaves 8-12 in. long 46. *C. grandifolium*.Leaves ovate-orbicular rounded at the base 47. *C. speciosum*.Leaves cordate-orbicular 48. *C. orbiculare*.

††Inflorescence not capitate.

Panicle small.

Leaves oblanceolate-oblong, deeply toothed 49. *C. incisum*.Leaves orbicular, not cordate 50. *C. rotundifolium*.

Leaves cordate broadly ovate.

Calyx small 51. *C. Greyi*.

Calyx medium-sized.

Corolla-tube 1½ in. long 52. *C. Welwitschii*.Corolla-tube 4 in. long 53. *C. Guerkei*.

Calyx large.

Leaves entire.

Leaves finely pubescent 54. *C. zambesiicum*.Leaves velvety 55. *C. Stuhlmanni*.Leaves repand 56. *C. Poggei*.Panicle large, thyrsoid 57. *C. thyrsoidium*.

***CYCLONEMA. Segments of the lower lip of the corolla longer than the upper, concave.

†Stems unarmed.

Cymes lax.	
Corolla-tube very short.	
Leaves sessile or very shortly petioled.	
Stems not winged	58. <i>C. myricoides</i> .
Stems winged	59. <i>C. alatum</i> .
Leaves with a short petiole.	
Leaves small, toothed	60. <i>C. Neumayeri</i> .
Leaves large, entire	61. <i>C. Kalbreyeri</i> .
Leaves long-petioled	62. <i>C. carnosulum</i> .
Corolla-tube $\frac{1}{3}$ – $\frac{1}{2}$ in. long	63. <i>C. bukobense</i> .
Corolla-tube $\frac{1}{2}$ – $\frac{3}{4}$ in. long	
Leaves sessile	64. <i>C. ternatum</i> .
Leaves distinctly petioled	65. <i>C. sansibarensis</i> .
Corolla-tube an inch or more long	66. <i>C. lanceolatum</i> .
Cymes dense.	
Calyx-lobes orbicular, small	67. <i>C. aurantiacum</i> .
Calyx-lobes ovate or oblong, large	68. <i>C. macrostachyum</i> .
†† Stems armed	69. <i>C. spinescens</i> .

1. **C. acerbianum**, *Boiss. Fl. Orient.* iv. 536. An erect shrub, with densely pubescent branchlets. Leaves 2–4-nate, shortly petioled, ovate, acute, entire, rounded at the base or slightly cordate, pubescent, especially beneath, the lower 2–3 in. long. Flowers in dense terminal and axillary peduncled clusters; bracts linear, as long as the calyx. Calyx densely pubescent, $\frac{3}{4}$ in. long; tube short, campanulate; lobes lanceolate. Corolla white; tube pubescent, 1 in. long; lobes ovate, sub-equal, $\frac{1}{6}$ in. long. Stamens $\frac{1}{2}$ in. long. Fruit globose, $\frac{1}{3}$ in. in diam., covered with spongy processes so that it resembles a bramble.—*Volkameria acerbiana*, *Visiani, Ic. Pl. Ægypt. Nub.* 23, t. 4, fig. 1; *Schauer in DC. Prod.* xi. 656.

Nile Land. Nubia: banks of the Nile, at Ibrim, *Letourneux*, 292! Saboos, *Kralik!* *Derr, Ehrenberg!* Abldekerin, *Raddi!* and Mograd Island, *Kotschy*, 359! by the White Nile, *Schweinfurth*, 1055! 1092! *Petherick!*

2. **C. sinuatum**, *Hook. in Bot. Mag. t.* 4255, and *ex Schauer in DC. Prod.* xi. 665. An erect shrub with pubescent branchlets. Leaves opposite, ovate, distinctly petioled, cuspidate, entire, slightly cordate at the base, entire or coarsely serrate, 4–6 in. long, finely pubescent on both surfaces. Flowers in dense globose terminal clusters. Calyx very hairy, $\frac{1}{3}$ in. long; lobes ovate-lanceolate, as long as the funnel-shaped tube. Corolla white; tube $\frac{3}{4}$ –1 in. long; lobes oblong, subequal, $\frac{1}{3}$ in. long. Stamens $\frac{3}{4}$ –1 in. long.—*Benth. in Hook. Niger Fl.* 486.

Upper Guinea. Sierra Leone, *Whitfield!* and cultivated specimens! Lagos: Abeokuta, *Harrison*, 2! *Millen*, 151!

3. **C. eupatorioides**, *Baker*. An erect herb, 4–6 ft. high, with slender finely hairy branchlets. Leaves opposite, long-petioled, ovate, acute, membranous, 3–4 in. long, irregularly crenate, glabrous above, obscurely pubescent beneath. Flowers in dense globose terminal clusters; bracts lanceolate. Calyx hairy, $\frac{1}{3}$ in. long; lobes lanceolate,

much longer than the campanulate tube. Corolla-tube above an inch long; limb oblique, $\frac{1}{2}$ in. long, the subequal oblong lobes not reaching down to the base. Stamens shorter than the corolla-limb; anthers large.

Upper Guinea. Cameroons: Cameroon Mountain, 2000 ft., *Mann*, 1295!

4. **C. Schweinfurthii**, *Gürke in Engl. Jahrb.* xviii. 177. A climbing shrub, with glabrous branchlets. Leaves shortly petioled, ovate-lanceolate, 6–8 in. long, $2\frac{1}{2}$ –5 in. broad, acute or acuminate, cuneate at the base, often sharply serrate, glabrous on both surfaces. Flowers in axillary long-peduncled heads; bracts small, subulate. Calyx-tube campanulate; teeth very small, deltoid. Corolla-tube glabrous, $1\frac{1}{4}$ – $1\frac{1}{2}$ in. long. Stamens and style very long. Drupe black, $\frac{1}{3}$ in. long.

Nile Land. British East Africa: Niamniam; at Nabambisso River, *Schweinfurth*, 3021! 3224! Lendu Plateau, *Stuhlmann*, 2701; ford on the Ituri River, *Stuhlmann*, 2632, and at Undusuma, west of Lake Albert, *Stuhlmann*, 2596.

Mozamb. Dist. German East Africa: Karagwe; Ihangiro, *Stuhlmann*, 897.

5. **C. Bakeri**, *Gürke in Engl. Jahrb.* xviii. 175. A shrub, with glabrous branchlets. Leaves opposite, shortly petioled, oblong or obovate, entire, cuspidate, 4–6 in. long, deltoid or slightly rounded at the base, membranous, green and glabrous on both surfaces. Flowers in dense peduncled globose terminal heads. Calyx glabrous, $\frac{1}{6}$ in. long; lobes ovate, rather shorter than the oblong tube. Corolla-tube straight, glabrous, $1\frac{1}{4}$ in. long; lobes obovate, subequal, $\frac{1}{6}$ in. long. Stamens $\frac{1}{2}$ – $\frac{5}{8}$ in. long.—*C. congense*, Baker in Kew Bulletin, 1892, 127, not of Engl.

Upper Guinea. Sierra Leone: near Musaia, *Scott-Elliott*, 5201! Falaba, *Scott-Elliott*, 5309!

Lower Guinea. Lower Congo; below Stanley Pool, *Johnston*!

6. **C. conglobatum**, *Baker*. A climbing shrub, with densely pubescent slender woody branchlets. Leaves opposite, distinctly petioled, oblong, entire, cuspidate or obtuse, 3–4 in. long, thinly hairy on both surfaces; base of petiole indurated, persistent. Flowers in dense globose terminal shortly-peduncled clusters. Calyx densely hairy, $\frac{1}{3}$ in. long; lobes large, ovate; tube small, funnel-shaped. Corolla white; tube 1 in. long; lobes obovate, subequal, $\frac{1}{4}$ in. long. Stamens 2–3 times the length of the corolla-lobes.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5629!

7. **C. kentrocaule**, *Baker*. A climbing shrub, with glabrous branches armed with the persistent indurated bases of the old petioles. Leaves opposite, oblong, entire, acute, short petioled, 3–4 in. long, glabrous on both sides. Cymes forming a short terminal thyrsoid panicle. Calyx glabrous, $\frac{1}{6}$ in. long; tube campanulate; teeth ovate,

shorter than the tube. Corolla-tube twice as long as the calyx; lobes subequal, $\frac{1}{8}$ in. long. Stamens $\frac{1}{2}$ in. long.

Lower Guinea. Angola: Pungo Andongo, *Welwitsch*, 5682!

8. **C. glabrum**, *E. Meyer*; *Schauer in DC. Prod.* xi. 661. An erect shrub with slender woody finely pubescent branchlets. Leaves 2-3-nate, shortly-petioled, oblong, acute, entire, subcoriaceous, glabrous, 2-4 in. long. Cymes dense, many-flowered; branchlets pubescent; pedicels very short. Calyx pubescent, $\frac{1}{8}$ in. long; tube campanulate; lobes ovate, shorter than the tube. Corolla-tube $\frac{1}{4}$ - $\frac{1}{3}$ in. long; lobes obovate, $\frac{1}{8}$ - $\frac{1}{6}$ in. long. Stamens twice as long as the corolla-lobes. Drupe small, 1-2-celled.

Nile Land. British East Africa: Mombasa, on dry coral, *Scott-Elliott*, 6103!

Lower Guinea. Angola: *Welwitsch*, 5625! 5651! 5656! 5657! 5710! 5721! 5752! 5753! *Monteiro*!

Mozamb. Dist. German East Africa: French Island, *Kirk*, 20! and without precise locality, *Kirk*! Portuguese East Africa: Mozambique, *Forbes*! Mouth of the West Luabo River, *Kirk*! Lower Zambesi; Tete, *Kirk*!

Also in South Africa.

9. **C. volubile**, *Beauv. Fl. Owar.* i. 52, t. 32. A climbing shrub, with slender woody branchlets. Leaves opposite, petioled, oblong, acute, entire, glabrous. Cymes many-flowered, forming ample terminal panicles; branchlets finely pubescent; pedicels often longer than the calyx. Calyx campanulate, $\frac{1}{8}$ in. long; tube campanulate; lobes small, ovate. Corolla-tube $\frac{1}{4}$ - $\frac{1}{3}$ in. long; lobes white, obovate, subequal, $\frac{1}{8}$ in. long. Stamens $\frac{1}{2}$ in. long. Drupe globose, 1-2-lobed, $\frac{1}{4}$ in. diam.—*Schauer in DC. Prod.* xi. 661; *Benth. in Hook. Niger Fl.* 486; *Cummins in Kew Bulletin* 1898, 77; *Henriques in Bolet. Soc. Brot.* xvi. 69. *C. multiflorum*, *G. Don*; *Schauer in DC. Prod.* xi. 673.

Upper Guinea. Sierra Leone: near Kambia, on the River Scarcies, *Scott-Elliott*, 4424! Samu country, *Scott-Elliott*, 4237! near Sasseni, *Scott-Elliott*, 4417! and without precise locality, *Don*! Ashanti, *Cummins*, 125! Lagos: Eppah, *Barter*, 3275! Abeokuta, *Irving*, 87! Jasohe, *Irving*, 90! and without precise locality, *Moloney*! *Millen*, 82! Cameroons: Yaunde, 2600 ft., *Zenker and Staudt*, 139! Fernando Po, *Mann*, 71.

Lower Guinea. Princes Island, *Barter*, 2030! Gaboon: Como River, *Bates*, 501! Gaboon River, *Mann*, 935! Congo, *Smith*! Stanley Pool, *Hens*, B 367! Angola, *Welwitsch*, 5630! 5659! 5662! 5675! *Monteiro*! River Luachimo, *Marques*, 330.

10. **C. Formicarum**, *Gürke in Engl. Jahrb.* xviii. 179. A shrub, with very slender finely pubescent branchlets. Leaves 2-4-nate, cuneate at the base, thin, oblong, acute, entire, 2-3 in. long, glabrous on both sides. Cymes numerous, many-flowered, long-peduncled, forming a subumbellate terminal panicle; branches finely pubescent; pedicels short. Calyx subglabrous, $\frac{1}{12}$ in. long; teeth ovate, shorter than the campanulate tube. Corolla white; tube 2-3 times the length of the calyx; lobes subequal, $\frac{1}{12}$ in. long. Stamens 2-3 times the

length of the corolla-lobes—Henriques in Bolet. Soc. Brot. xvi. 69.
C. triplinerve, Rolfe in Bolet. Soc. Brot. xi. 87.

Upper Guinea. Old Calabar, *Holland!*

Lower Guinea. Angola: Golungo Alto, *Welwitsch*, 5622! 5661! Malange, *Buchner*, 77, *Mechow*, 192, *Marques*, 9! 50.

South Central. Congo Free State: Monbuttu; Munza, *Schweinfurth*, 3483! and at the Kussumbo River, *Schweinfurth*, 3641! Lunda; Mussumba, *Pogge*, 338.

Mozamb. Dist. German East Africa: Karagwe; Bukoba, *Stuhlmann*, 1026.

I cannot from the description separate *C. Lujæi*, De Wild & Durand in Comptes-rendus Soc. Bot. Belg. xxxviii. 213, collected by Luja on the Lower Congo.

11. **C. ovale**, *Klotzsch in Peters, Reise Mossamb. Bot.* 257. A shrub 6–7 ft. high, with woody glabrous branchlets. Leaves 2–3-nate, distinctly petioled, oblong, obtuse, entire, cuneate at the base, $1\frac{1}{2}$ –2 in. long, finely pubescent, copiously gland-dotted. Cymes few-flowered, terminal and axillary; pedicels finely pubescent. Calyx pubescent, $\frac{1}{8}$ in. long; tube campanulate; lobes suborbicular. Corolla-tube $\frac{1}{3}$ in. long; lobes small, subequal. Stamens longer than the corolla-lobes.—*Vatke in Linnæa*, xliii. 537.

Mozamb. Dist. German East Africa: Usambara; Muoa, *Holst*, 3076 Usaramo; Bagamoyo, *Hildebrandt*, 1298! Portuguese East Africa: Rio de Sena, *Peters*.

12. **C. Barteri**, *Baker*. A shrub, with finely pubescent branchlets. Leaves shortly petioled, oblong or obovate-oblong, 4–6 in. long, cuspidate, entire, narrowed to the base, moderately firm, green and glabrous above, slightly pubescent on the main veins beneath. Cymes dense, terminal, peduncled, 2 in. diam.; bracts linear; pedicels short. Calyx glabrous, $\frac{1}{8}$ in. long; tube campanulate; teeth ovate, spreading, nearly as long as the tube. Corolla white; tube cylindrical, twice the length of the calyx; segments of the limb obovate, $\frac{1}{12}$ in. long. Stamens 3 times the length of the corolla-limb.

Upper Guinea. Niger Delta: Brass, *Barter*, 51!

13. **C. toxicarium**, *Baker*. A shrub, with pubescent woody branchlets. Leaves petioled, oblong, entire, acute, 3–6 in. long, rounded at the base, nearly glabrous above when mature, finely pubescent beneath. Cymes many-flowered, dense, long-peduncled, forming an ample terminal panicle; branches finely pubescent; pedicels short. Calyx pubescent, $\frac{1}{8}$ in. long; teeth ovate, as long as the campanulate tube. Corolla-tube $\frac{1}{3}$ – $\frac{1}{2}$ in. long; lobes obovate, $\frac{1}{12}$ in. long. Stamens $\frac{1}{2}$ in. long. Drupe the size of a pea.

Mozamb. Dist. British Central Africa: Nyasaland; River Shire, *Kirk!* Shibisa (Chikwawa), *Meller!* Blantyre, *Buchanan*, 179! and without precise locality, *Buchanan*, 1075!

14. **C. tanganyikense**, *Baker in Kew Bulletin*, 1895, 71. An erect shrub, with densely pubescent branches. Leaves opposite,

shortly petioled, oblong, 3–4 in. long, 2–2½ in. broad at the middle, cuspidate, subentire, green and nearly glabrous on the face, light green and densely pubescent on the back. Cymes axillary and forming a terminal panicle; pedicels densely pubescent; bracts lanceolate, minute. Calyx pubescent, ⅙ in. long; teeth small, ovate. Corolla-tube twice as long as the calyx; limb ¼ in. in diam. Stamens twice as long as the corolla-lobes.

Mozamb. Dist. German East Africa: Urundi; on low hills to the North-east of Lake Tanganyika, 5000–7000 ft., *Scott-Elliot*, 8228! 8378! British Central Africa: Urungu; Fwambo, *Carson*, 52!

15. **C. Kirkii**, *Baker*. A shrub 4 ft. high, with pubescent branchlets. Leaves mostly ternate, shortly petioled, oblong, 2–3 in. long, acute or cuspidate, rounded at the base, deeply and irregularly crenate, moderately firm, thinly pubescent above, densely pubescent beneath. Cymes forming a lax small terminal panicle; pedicels short, pubescent. Calyx pubescent, ⅙ in. long; tube campanulate; teeth ovate, shorter than the tube. Corolla white; tube cylindrical, ½ in. long; segments of the limb obovate, ⅙ in. long. Stamens three times the length of the corolla-lobes.

Mozamb. Dist. British Central Africa: Nyasaland; Upper Shire Valley, *Kirk*!

16. **C. Melanocrater**, *Gürke in Engl. Jahrb.* xviii. 180. A shrub, with branchlets pubescent upwards. Leaves distinctly petioled, ovate or ovate-oblong, acuminate, 2–3 in. long, 1–1½ in. broad, rounded or subcordate at the base, glabrous on both surfaces. Cymes lax, terminal, 4–5 in. long; pedicels ⅓–½ in. long; bracts linear or filiform. Calyx subglabrous or puberulous; tube campanulate; teeth deltoid. Corolla-tube puberulous, ¼ in. long. Stamens much longer than the lobes.

South Central. Congo Free State: near the Itiri River, 4000 ft., *Stuhlmann*, 2698.

Mozamb. Dist. German East Africa: Karagwe; Bukoba, *Stuhlmann*, 3322, 3650, 3720.

17. **C. silvæanum**, *Henriques in Bolet. Soc. Brot.* x. 148. A wide-climbing shrub, with glabrous branchlets. Leaves ovate, cuspidate, 3–6 in. long, entire, glabrous, shining; petiole 1–2 in. long. Panicle sparse, terminal; branchlets pubescent; bracts small, linear, deciduous. Calyx ⅙ in. long; teeth triangular, rather shorter than the campanulate tube. Corolla white, twice as long as the calyx; lobes ovate, subequal. Stamens much exserted.

Lower Guinea. Island of St. Thomas, plain of Io Grande, 300 ft., *Quintas*, and plain of Contador, 4500 ft., *Quintas*.

18. **C. eriophyllum**, *Gürke in Engl. Jahrb.* xviii. 178. A shrub, with pubescent branchlets. Leaves shortly petioled, ovate, acute, entire, coriaceous, 2–2½ in. long, rounded at the base, pubescent on both sides,

velvety beneath. Flowers in lax compound terminal cymes; pedicels $\frac{1}{12}$ – $\frac{1}{6}$ in. long; bracts lanceolate, longer than the pedicels. Calyx tomentose, $\frac{1}{8}$ – $\frac{1}{5}$ in. long; teeth narrow, acuminate. Corolla-tube $\frac{1}{2}$ in. long, glandular, pubescent.

Mozamb. Dist. German East Africa, *Fischer*, 331.

19. **C. polycephalum**, *Baker in Kew Bulletin*, 1895, 116. An erect shrub, with branches densely clothed with ferruginous hairs. Leaves opposite or ternate, distinctly petioled, cordate, ovate, 3–4 in. long, cuspidate, entire, green and pubescent on both surfaces. Cymes many, dense, many-flowered, terminal; peduncles and pedicels pubescent. Calyx pilose, $\frac{1}{8}$ in. long; tube obconic; teeth ovate, as long as the tube. Corolla-tube cylindrical, 2–3 times the length of the calyx; lobes small, obovate. Stamens much longer than the corolla-lobes.

Upper Guinea. Lagos: Ogbomoshaw, *Rowland!* near Otto, *Millen*, 12! Ayesan, *Millen*, 153! and without precise locality, *Millen*, 157!

20. **C. Johnstoni**, *Oliv. in Trans. Linn. Soc. ser. 2, ii.* 346. A shrub, with densely pubescent woody branches. Leaves 2–3-nate, long petioled, oblong, entire, rounded at the apex to a small cusp, cordate and broadly rounded at the base, 3–4 in. long, thinly pubescent above, densely pubescent beneath. Cymes many-flowered, forming an ample dense corymbose terminal panicle; branches very hairy; pedicels short. Calyx very hairy, $\frac{1}{8}$ in. long; teeth ovate, shorter than the campanulate tube. Corolla-tube twice as long as the calyx; lobes subequal, $\frac{1}{8}$ in. long. Stamens twice as long as the corolla-lobes.

Nile Land. British East Africa: common on Ruwenzori, 7000–8600 ft., *Scott-Elliott*, 7691!

Mozamb. Dist. German East Africa: Kilimanjaro, at 5000 ft., *Johnston!* *Volkens*, 2072!

21. **C. syringæfolium**, *Baker in Kew Bulletin*, 1898, 160. A shrub, with quadrangular pubescent branchlets. Leaves long-petioled, cordate-ovate, 2–3 in. long, entire, cuspidate, pubescent on both surfaces, conspicuously dotted beneath with black glands. Cymes forming a dense terminal panicle; pedicels short, pubescent. Calyx campanulate, green, glabrous, $\frac{1}{4}$ in. long; lobes lanceolate, acuminate, longer than the tube. Corolla-tube cylindrical, 5–6 in. long; limb $\frac{1}{4}$ in. in diam.; lobes sub-orbicular. Stamens three times the length of the perianth-lobes.

Mozamb. Dist. British Central Africa: Nyasaland; between Mpata and the commencement of the Tanganyika Plateau, *Whyte!*

22. **C. splendens**, *G. Don; Schauer in DC. Prod.* xi. 662. A climbing shrub with glabrous branchlets. Leaves opposite, shortly petioled, oblong, entire, acute, subcoriaceous, glabrous, rarely hairy, 3–6 in. long. Cymes dense, many-flowered, forming an ample terminal

panicle; pedicels pubescent, longer than the calyx. Calyx $\frac{1}{8}$ in. long; lobes ovate or ovate-lanceolate, rather shorter than the tube. Corolla bright red, passing into bright yellow: tube $\frac{3}{4}$ –1 in. long; lobes obovate, subequal, $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Stamens 1 in. long.—Benth. in Hook. Niger Fl. 486; Durand & De Wild. in Bull. Soc. Bot. Belg. xxxvii. 125. *C. aurantium*, G. Don; Schauer in DC. Prod. xi. 673.

Upper Guinea. Sierra Leone, *Barter!* *Oldfield!* *Don!* Lagos: Yero, *Millen*, 9! Abeokuta, *Rowland!* and without precise locality, *Moloney*, 14! Lower Niger; Onitsa, *Barter!* Old Calabar, *Thomson*, 7! Cameroons: Bipinde, *Zenker*, 1048! Yaunde, *Zenker & Staudt*, 115! River Cameroon, *Mann*, 732!

Lower Guinea. Gaboon: River Gaboon, *Mann!* Munda, at Sibange Farm, *Soyaux*, 12! Congo, *Smith!* *Burton!* Bingila and Ki-binga, *Dupuis*. Loango, *Soyaux*, 75! Angola, *Welwitsch*, 5646! 5664! 5740! Malange, *Marques*, 5!

C. speciosum (Rev. Hort. 1873, 471, with coloured figure), and Garden, xi. (1877) 404, pl. 74, said to be a hybrid, recedes very little from typical *C. splendens*, but the plant figured as *C. speciosum hybridum* in Ill. Hort. 1869, t. 593, comes midway between *C. splendens* and *C. Thomsonæ*.

23. **C. Buchholzii**, *Gürke in Engl. Jahrb.* xviii. 176. A climbing shrub, glabrous in all its parts. Leaves distinctly petioled, oblong, rounded at the base, 4–7 in. long by half as broad, acuminate, entire, green and glabrous on both sides. Cymes forming axillary panicles; pedicels long; bracts minute, filiform. Calyx glabrous, $\frac{1}{3}$ in. long; tube between cylindrical and funnel-shaped; teeth small, deltoid. Corolla white, glabrous; tube $\frac{1}{2}$ – $\frac{3}{4}$ in. long; lobes obovate, $\frac{1}{4}$ in. long. Stamens twice as long as the lobes.

Upper Guinea. Cameroons: Victoria, *Buchholz*, between Barombi and Kumba, *Preuss*, 404! and on the north bank of Elephant Lake, *Preuss*, 497! Gaboon: Como River, *Bates*, 473!

Lower Guinea. Angola: Pungo Andongo, *Mechow*, 86.

This may be identical with *C. Manetti*, Vis. Ill. Piante Orto Padova, iii. (1856) 20, t. 3, a garden plant of uncertain origin.

24. **C. harnierianum**, *Schweinf. Beitr. Fl. Aethiop.* 119. Branchlets herbaceous, tetragonous. Leaves 2–3-nate, petioled, membranous, oblong or oblong-lanceolate, narrowed to the base and acute apex, about 2 in. long by 1 in. broad, pubescent on both surfaces. Cymes lax, forming a terminal panicle; pedicels slender, pubescent. Calyx glabrate, $\frac{1}{3}$ in. long; tube campanulate; lobes ovate-lanceolate, very acute, as long as the tube. Corolla pubescent, purple, 2–3 times as long as the calyx.

Nile Land. Sennar: near Roseres, *Cienkowsky*. White Nile, *Harnier*.

25. **C. congense**, *Engl. in Engl. Jahrb.* viii. 65. Branchlets angular. Leaves shortly petioled, glabrous above, hairy on the ribs and glandular beneath, the lower oblong, 4 in. long, 3 in. broad, with a rounded base, the upper cordate-ovate. Inflorescence corymbose; branchlets hairy; bracts deciduous, linear or linear-lanceolate. Calyx $\frac{1}{3}$ in. long; teeth deltoid, as long as the campanulate tube. Corolla-tube above $\frac{1}{2}$ in.

long; lobes obovate-oblong, unequal, $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Stamens much longer than the lobes. Drupe subglobose.

Lower Guinea. Lower Congo: at Boma, *Naumann*, and Ponta da Lenha, *Naumann*.

26. **C. Dinklagei**, *Gürke in Engl. Jahrb.* xviii. 175. A shrub; branchlets densely clothed with reflexed articulated hairs. Leaves oblong, acuminate, 3–4 in. long, rounded to the base, entire, sparsely clothed with adpressed hairs on both surfaces; petiole 2–4 in. long. Cymes axillary, few-flowered; bracts minute, subulate. Calyx 5-partite nearly to the base; lobes ovate-lanceolate, acuminate, pubescent. Corolla not known.

Upper Guinea. Cameroons: Great Batanga, *Dinklage*, 1008.

27. **C. Buettneri**, *Gürke in Engl. Jahrb.* xviii. 174. A shrub; branchlets densely clothed with long articulated hairs. Leaves shortly petioled, oblong, acuminate, entire, unequally cordate at the base, 3–4 in. long, $1-1\frac{1}{2}$ in. broad, villous principally on the under surface. Cymes few-flowered, terminal; pedicels long; bracts minute, filiform. Calyx slit nearly to the base; lobes ovate-lanceolate, pilose. Corolla-tube pilose, rather longer than the calyx, $\frac{2}{3}$ in. long. Stamens long.

Lower Guinea. Gaboon: Munda; Sibange Farm, *Büttner*, 426.

28. **C. Giletii**, *De Wild. & Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 113. A climbing shrub, with glabrous branchlets. Leaves petioled, glabrous, ovate, 3–4 in. long, $1-1\frac{1}{2}$ in. broad, acuminate, rounded at the base. Cymes lateral, few-flowered, shorter than the leaves; peduncle and pedicels brown-velvety; bracts narrow, acute. Calyx $\frac{1}{4}$ in. long; teeth deltoid, acute, as long as the tube. Corolla hypocrateriform; tube nearly 1 in. long; lobes half as long as the tube. Stamens $1\frac{1}{2}$ in. long.

Lower Guinea. Congo Free State; Dembo, *Gilet*.
Near *C. splendens*, G. Don.

29. **C. Preussii**, *Gürke in Engl. Jahrb.* xviii. 175. A climbing shrub, glabrous in all its parts. Leaves distinctly petioled, ovate, entire, acuminate, 3–5 in. long, 2–3 in. broad, rounded to the base, green and glabrous on both surfaces. Cymes axillary, long-peduncled and forming terminal panicles; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in. long; bracts minute, subulate. Calyx glabrous, $\frac{1}{4}$ in. long; teeth ovate, acute, very small. Corolla white; tube $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Stamens long.

Upper Guinea. Cameroons: Buea, *Preuss*, 940, 1008.

30. **C. Hildebrandtii**, *Vatke in Linnæa*, xliii. 536. A shrub with pale woody glabrous branchlets. Leaves opposite, long-petioled, broadly ovate, entire, 2–3 in. long and broad, green and glabrous on both surfaces. Cymes long, axillary, and forming a terminal panicle, few-

flowered; pedicels often longer than the calyx. Calyx glabrous, $\frac{1}{3}$ – $\frac{1}{2}$ in. long; tube tubular-subcampanulate; teeth ovate, much shorter than the tube. Corolla white; tube above 1 in. long; lobes subequal, $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Stamens twice as long as the corolla-tubes. Fruit-carpels large, oblong, glabrous.

Nile Land. British East Africa: Mombasa, 300 ft., *Wakefield!* *Kirk!* Nyika country, near Mombasa, *Wakefield!* Taita; Ndara Mountains, *Hildebrandt*, 2389.

Mozamb. Dist. German East Africa: Bombuera, *Holst*, 2200! and without precise locality, *Hannington!*

31. **C. Thomsonæ**, *Balf. f. in Trans. Bot. Soc. Edin.* vii. 265, t. 7 and 580, t. 16. A climbing shrub, with glabrous branchlets. Leaves opposite, shortly petioled, thin, ovate or oblong, acute, entire, glabrous, 3–6 in. long. Cymes lax, many-flowered; pedicels as long as the calyx. Calyx white, pentagonal, $\frac{1}{2}$ – $\frac{3}{4}$ in. long; tube very small; lobes large, ovate, acute. Corolla light crimson; tube 1 in. long; lobes subequal, oblong, $\frac{1}{4}$ in. long. Stamens $\frac{3}{4}$ in. long.—*Hook. in Bot. Mag.* t. 5313 *Houlet in Rev. Hort*, 1867, 312, with figure.

Upper Guinea. Niger Delta: Angiama, *Barter*, 2093! Old Calabar River, *Thomson*, cultivated specimen! *Mann*, 2327! Cross River, *Johnston!*

32. **C. Holstii**, *Gürke MS. in Herb. Kew.* An erect shrub, with densely pubescent white branchlets. Leaves shortly petioled, ovate, $1\frac{1}{2}$ –2 in. long, acute or obtuse, entire, rounded at the base, moderately firm, slightly pubescent above, densely pubescent beneath. Cymes small, dense, terminal; pedicels very short, densely pubescent. Calyx $\frac{1}{8}$ in. long, densely pubescent; lobes ovate, rather shorter than the campanulate tube. Corolla-tube cylindrical, $\frac{3}{4}$ in. long; segments of the limb orbicular, $\frac{1}{8}$ in. broad. Stamens much exerted.

Mozamb. Dist. German East Africa: Usambara; Duga, *Holst*, 3208!

33. **C. tricholobum**, *Gürke in Engl. Jahrb.* xviii. 178. A shrub, with tomentose or pubescent branchlets. Leaves shortly petioled, ovate, acute or acuminate, rounded at the base, entire, 2–3 in. long, coriaceous, velvety on both sides. Cymes long-peduncled, lax, axillary; pedicels $\frac{1}{12}$ – $\frac{1}{5}$ in. long; bracts lanceolate, lower $\frac{1}{2}$ in. long. Calyx pilose, $\frac{1}{4}$ in. long; lobes long, subulate. Corolla-tube $\frac{1}{2}$ – $\frac{3}{4}$ in. long, glandular pubescent.

Mozamb. Dist. German East Africa: Usambara; Pangani, *Stuhlmann*, 587. Portuguese East Africa: Mozambique, *Stuhlmann*, 444.

34. **C. pleiosciadium**, *Gürke in Engl. Jahrb.* xviii. 177. Leaves distinctly petioled, ovate, acuminate, rounded or narrowed to the base, above 2 in. long, $1\frac{1}{2}$ in. broad, irregularly deeply toothed, sparingly pilose on the ribs on both sides; petiole $\frac{1}{2}$ –1 in. long. Cymes terminal, very compound, many-flowered; pedicels long; bracts filiform. Calyx glabrous, 5-partite below the middle; lobes lanceolate, acuminate. Corolla-tube glabrous, $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Stamens long.

Mozamb. Dist. German East Africa: Usegua; at Kiwanda, *Fischer*, 467.

35. **C. longipetiolatum**, *Gürke in Engl. Jahrb.* xviii. 178. An erect undershrub, with pubescent branchlets. Leaves long-petioled, broadly ovate, about 3 in. long, 2 in. broad, acuminate, obtuse at the base, distantly deeply serrated, pubescent on both surfaces. Panicle terminal; bracts $\frac{1}{2}$ – $\frac{1}{8}$ in. long, upper lanceolate, lower linear or subulate; pedicels long. Calyx campanulate, subglabrous; lobes very acuminate, longer than the tube. Corolla-tube 2–2½ times the length of the calyx.

Mozamb. Dist. German East Africa: Ukami; Mrogoro, *Stuhlmann*, 71.

36. **C. scandens**, *Beauv. Fl. Owar.* ii. 6, t. 62. A climbing shrub, with finely pubescent branchlets. Leaves opposite, petioled, cordate-ovate, acute, entire, 3–5 in. long, finely pubescent beneath. Cymes lax, few-flowered, forming an ample terminal panicle; pedicels pubescent, often longer than the calyx. Calyx green, finely pubescent, $\frac{1}{4}$ – $\frac{1}{3}$ in. long; tube campanulate; teeth ovate or lanceolate, as long as or longer than the tube. Corolla white; tube $\frac{1}{2}$ – $\frac{3}{4}$ in. long; lobes obovate, subequal, $\frac{1}{3}$ in. long. Stamens 1–1½ in. long.—*Schauer in DC. Prod.* xi. 662; *Hook. in Bot. Mag.* t. 4354; *Benth. in Hook. Niger Fl.* 486. *C. simplex* and *C. hirsutum*, *G. Don*; *Schauer in DC. Prod.* xi. 673.

Upper Guinea. Senegambia, *Heudelot*, 519! Sierra Leone, common, *Scott-Elliot*, 3831! 4148! *Don*! Liberia: Cape Palmas, *Vogel*, 53! Gold Coast, *Burton & Cameron*! Lagos, *Moloney*! Cameroons: Rio del Rey, *Johnston*! Fernando Po, *Vogel*, 98! *Barter*, 2058! *Ansell*! *Mann*, 83!

A plant gathered by Mann on the banks of the Muni River, 1° N. lat., having a much larger calyx, with longer teeth, is perhaps a distinct species.

37. **C. cordifolium**, *A. Rich. Tent. Fl. Abyss.* ii. 170. A climbing shrub with pubescent branchlets. Leaves opposite, petioled, subcoriaceous, cordate-ovate, entire, 3–4 in. long, glabrous above when mature, finely pubescent beneath. Cymes lax, forming an ample terminal panicle; branches pubescent; pedicels as long as the calyx. Calyx pubescent, $\frac{1}{3}$ in. long; tube campanulate; teeth ovate or ovate-lanceolate, as long as the tube. Corolla-tube twice as long as the calyx; lobes subequal, oblong, $\frac{1}{3}$ in. long. Stamens an inch long.—*Oliv. in Trans. Linn. Soc.* xxix. 132; *Engl. Hochgeberigsfl. Trop. Afr.* 357. *Volkameria cordifolia*, *Hochst.*; *Schauer in DC. Prod.* xi. 657.

Nile Land. Upper Sennar; Fazokl, *Kotschy*, 497! Abyssinia: mountain sides towards the River Tacazze, *Schimper*, 1132! British East Africa: Jur; Jur Ghattas, *Schweinfurth*, 1369! Moru; Neangara, *Petherick*! Madi, *Speke & Grant*, 676! Unyoro, *Speke & Grant*, 567!

38. **C. fuscum**, *Gürke in Engl. Jahrb.* xviii. 175. An erect or climbing shrub; branchlets clothed with articulated brown hairs. Leaves shortly petioled, broadly ovate or suborbicular, 2½–3½ in. long, deeply cordate, cuspidate, entire, hairy on both sides or glabrescent above. Cymes lax, few-flowered, axillary and terminal; pedicels long; bracts linear. Calyx $\frac{5}{8}$ – $\frac{3}{4}$ in. long, white, pubescent with brown hairs;

lobes lanceolate, acuminate, twice as long as the tube. Corolla-tube pilose, twice as long as the calyx. Stamens very long.

Nile Land. British East Africa: Mpororo; Kayonza Mountain, *Stuhlmann*, 3061, 3096.

Lower Guinea. Lower Congo; Manga, *Dupuis*.

South Central. Lunda: Lulua River, *Preuss*.

39. **C. Buchneri**, *Gürke in Engl. Jahrb.* xviii. 172. A shrub with pubescent young branchlets. Leaves shortly petioled, obovate-lanceolate, 3–4 in. long, 1–1½ in. broad, entire or slightly undulated, narrowed to the base, shortly cuspidate, glabrous above, pubescent with raised veins beneath. Inflorescence terminal, capitate; pedicels very short; bracts foliaceous, oblong-lanceolate. Calyx tubular-campanulate, pubescent, ¾ in. long; lobes long, ovate-lanceolate, acuminate. Corolla-tube long, glandular-pubescent; limb ½ in. long; lobes unequal. Stamens much exerted.

Lower Guinea. Angola: at Quifocussa on the River Kuango, *Mechow*, 557A, Malange, *Mechow*, 429; Feira, *Buchner*, 572.

Near *C. capitatum*, *Schumach. & Thonn.*

40. **C. strictum**, *Baker*. Stems woody, simple, erect, pubescent, 1½ ft. long. Leaves opposite, close, short-petioled, ascending, oblong, subcoriaceous, entire or irregularly repand, 5–6 in. long, subglabrescent above when mature, pubescent beneath principally on the raised veins. Cymes dense, terminal, globose, many-flowered; pedicels very short. Calyx hairy, ¾ in. long; tube very short; lobes large, ovate, acute, foliaceous. Corolla white; tube hairy, 2–2½ in. long; lobes subequal, oblong, ½–½ in. long. Stamens an inch long.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5685!

41. **C. capitatum**, *Schumach. & Thonn.*; *Schauer in DC. Prod.* xi. 673. An erect shrub, with densely hairy branchlets. Leaves opposite, distinctly petioled, oblong or obovate-oblong, acute or cuspidate, entire or slightly sinuate, ½–1 ft. long, when mature nearly glabrous above, pubescent beneath. Flowers in dense sessile terminal heads 6–9 in. diam.; bracts lanceolate, foliaceous, pubescent, as long as the calyx. Calyx pubescent, ½–¾ in. long; tube short, funnel-shaped; segments ovate, acute, densely ciliate. Corolla white; tube slender, pubescent, 3–4 in. long; lobes obovate, subequal, ½ in. long. Stamens curved, 2–3 times the length of the corolla-lobes.—*Hook. in Bot. Mag.* t. 4355; *Benth. in Hook. Niger Fl.* 486. *C. robustum*, *C. stenanthum* and *C. mossambicense*, *Klotzsch in Peters, Reise Mossamb. Bot.* 258–259. *C. francavilleianum*, *Buchinger, ined.*

Upper Guinea. Senegal: Mbidjem, *Thierry*! Gambia, *Ingram*! Sierra Leone, *Whitfield*! Gold Coast: Aquapim Mountains, *Vogel*! Lagos: Papalizato, *Millen*, 45! Abeokuta, *Irring*, 111! at the confluence of the Niger and Benue Rivers, *Barter*! Lower Niger: Onitsa, *Barter*, 342! Cameroons: Cameroon Mountain, 3000 ft., *Mann*, 1957! Rio del Rey, *Johnston*!

Nile Land. British East Africa: Ribe to Galla, *Wakefield!*

Mozamb. Dist. German East Africa: Usambara; Gonja, *Holst*, 4256! Unyamwezi; Msalala, *Hannington!* on the higher plateau north of Lake Nyasa, *Thomson!* Portuguese East Africa: Kerimba Islands, *Peters!* Lower Zambesi: Boror, *Peters!* Rio de Sena, *Peters!* Mozambique, *Peters!* British Central Africa: Urungu; Fwambo, *Carson*, 63! Tanganyika Plateau, *Carson!* Masuka Plateau, 6500–7000 ft., *Whyte!* Namasi, *Cameron*, 2! and without precise locality, *Whyte!* *Buchanan*, 1489!

Var. *cephalanthum*, Baker. Leaves glabrous when mature on both sides. Calyx and corolla-tube also glabrous—*C. cephalanthum*, Oliv. in Hook. Ic. Pl. t. 1559.

Upper Guinea. Sierra Leone, *Whitfield!*

Mozamb. Dist. Zanzibar, *Kirk!* *Bojer!*

42. **C. Fischeri**, *Gürke in Engl. Jahrb.* xviii. 172. A shrub 6–8 ft. high, with pubescent branchlets. Leaves shortly petioled, oblong, 4–5 in. long, acute, entire, narrowed to the base, coriaceous, reticulated, sparsely clothed above, densely beneath, with long hairs. Inflorescence capitate; flowers sessile; bracts and bracteoles lanceolate, acuminate, membranous, subvillous. Calyx campanulate, subvillous, $\frac{3}{4}$ in. long; tube very short; lobes ovate, acuminate. Corolla-tube slender, incurved, 4–5 in. long; lobes obovate, $\frac{1}{2}$ in. long. Stamens and style very long.

Mozamb. Dist. German East Africa: Usambara: at Sangawishi, near Bombuera, *Holst*, 2194, and Amboni, *Holst*, 2910! Usmawo; Kageyi on Lake Victoria, *Stuhlmann*, 3492; Usegua; Kiwanda, *Fischer*, 483.

Very near *C. capitatum*, Schumach. & Thonn.

43. **C. hysteroanthum**, Baker. A climbing shrub, with leaves and flowers developed at different seasons. Leaves thin, cordate-ovate, repand, thinly hairy on both sides, reaching a length of 8–12 in.; petiole reaching 6–7 in. Cymes dense, sessile. Calyx 1 in. long; tube small; lobes large, ovate, acute, foliaceous. Corolla white; tube 5–6 in. long; lobes subequal, $\frac{1}{2}$ in. long. Stamens twice as long as the corolla-lobes.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch!*

44. **C. megasepalum**, Baker. A shrub 5–6 ft. high, with pubescent branches. Leaves 2–3-nate, short-petioled, cordate-ovate, repand, subcoriaceous, 6–8 in. long, 4 in. broad, scabrous above, pubescent beneath. Cymes dense. Calyx pubescent, $\frac{3}{4}$ –1 in. long; tube small; lobes large, ovate, acute. Corolla-tube 5–6 in. long; lobes obovate, subequal, $\frac{3}{4}$ in. long. Stamens twice as long as the corolla-lobes

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5705!

45. **C. cuneifolium**, Baker. An erect shrub, with virgate woody hairy stems. Leaves opposite, short-petioled, obovate-cuneate, cuspidate, subcoriaceous, 3–4 in. long, repand in the upper half, cuneate in the lower half. Cymes dense, globose, sessile, terminal. Calyx hairy, $\frac{3}{4}$ in. long; tube small; teeth large, ovate, acute. Corolla-tube hairy,

1½–2 in. long; lobes subequal, ½ in. long. Stamens twice as long as the corolla-lobes.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5684!

46. **C. grandifolium**, *Gürke in Engl. Jahrb.* xviii. 173. A tree. Leaves long-petioled, obovate, acuminate, entire, 10–12 in. long, 5–6 in. broad, narrowed to the base, glabrous on both sides. Inflorescence capitate, terminal, long-peduncled; pedicels ½ in. long; bracts small, subulate. Calyx funnel-shaped, ¾ in. long, deeply 5-partite; lobes ovate-lanceolate, acuminate, ciliate. Corolla white; tube slender, glabrous, 5–6 in. long; lobes unequal. Stamens very long.

Lower Guinea. Angola: near the River Kuango, Majakalla district, *Mechow*, 530.

47. **C. speciosum**, *Gürke in Engl. Jahrb.* xviii. 171. A shrub or tree. Leaves shortly petioled, ovate-orbicular, 8–10 in. long, 6–8 in. broad, rounded or subcordate at the base, acute, entire, coriaceous, scabrous above, pubescent beneath. Cymes forming a dense short panicle; pedicels long; bracts lanceolate, acuminate, pubescent, ½ in. long. Calyx campanulate, deeply 5-partite, reddish, pubescent, 1 in. long; lobes lanceolate, acuminate. Corolla-tube slender, curved, 5–6 in. long; lobes unequal, ⅓–½ in. long. Stamens and style very long.

Lower Guinea. Angola: province of Pungo Andongo, *Mechow*, 121, *Soyaux*, 230!

48. **C. orbiculare**, *Baker*. A shrub, with pubescent branches. Leaves cordate-orbicular, thin, repand, pubescent on both sides, sometimes a foot long and nearly as broad; petiole 4 in. long. Cymes dense, capitate, terminal; pedicels short. Calyx pubescent, ¾ in. long; lobes ovate, acute, twice as long as the funnel-shaped tube. Corolla-tube densely pubescent, 5 in. long; lobes obovate, subequal, ⅓–½ in. long. Stamens above 1 in. long.

Lower Guinea. Angola, *Welwitsch*, 5688!

49. **C. incisum**, *Klotzsch in Peters, Reise Mossamb. Bot.* 257. An erect shrub, with scabrous branchlets. Leaves 2–3-nate, shortly petioled, oblanceolate-oblong, membranous, narrowed to both ends, deeply inciso-pinnatifid, finely pubescent on both sides, 3–4 in. long by half as broad at the middle. Flowers in a sessile terminal head; bracts oblong-lanceolate, longer than the calyx. Calyx glabrous, ⅙ in. long; tube funnel-shaped; teeth small, deltoid. Corolla white; tube slender, glabrous, 2½–3 in. long; limb oblique, ½ in. long; lobes oblong, not reaching down to the base. Filaments red, 2 in. long.—*Vatke in Linnæa*, xliii. 537.

Nile Land. British East Africa: near Lamu, *Hildebrandt*.

Mozamb. Dist. German East Africa: Usambara; Doda, *Holst*, 2954! Portuguese East Africa: Kerimba Islands, *Peters*; Rios de Sena, *Peters*.

Var. *macrosiphon*, Baker. Branchlets, calyx, and corolla-tube pubescent—*C. macrosiphon*, Hook. f. in Bot. Mag. t. 6695.

Mozamb. Dist. German East Africa : in Usaramo, *Kirk!*
Introduced into cultivation by Sir John Kirk in 1881.

50. **C. rotundifolium**, *Oliv. in Trans. Linn. Soc.* xxix. 132, t. 89. A shrub, with densely pubescent woody branchlets. Leaves opposite, distinctly petioled, orbicular, not cordate, crenate, about 3 in. long and broad, obscurely pubescent above when mature, densely pubescent beneath. Cymes terminal, peduncled, lax, few-flowered; pedicels long, pubescent; bracts linear. Calyx pubescent, $\frac{1}{2}$ in. long; tube short, campanulate; lobes ovate, acuminate. Corolla-tube slender, pubescent, $2\frac{1}{2}$ in. long, dilated at the apex; lobes obovate, $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Stamens 3 times the length of the corolla-lobes.

Nile Land. British East Africa : Ruwenzori; Mubuku Valley, in the Toru district, 4000 ft., *Scott-Elliott*, 7571!

Mozamb. Dist. German East Africa : Karagwe, *Speke & Grant*, 461!

51. **C. Greyi**, *Baker*. A shrub, with finely pubescent branchlets. Leaves opposite, shortly petioled, cordate-ovate, obscurely crenate, deltoid at the apex, 2 in. long and broad, densely pubescent on both sides. Cymes few-flowered, peduncled, forming a lax ample terminal panicle; branchlets finely pubescent; pedicels short. Calyx finely pubescent, $\frac{1}{8}$ in. long; tube campanulate; teeth ovate, rather shorter than the tube. Corolla-tube above 1 in. long; limb oblique, $\frac{3}{4}$ in. long; lobes obovate, not reaching down to the base. Stamens curved, twice as long as the limb.

West Tropical Africa. Without locality, *Grey!*

52. **C. Welwitschii**, *Gürke in Engl. Jahrb.* xviii. 174. A climbing shrub, with woody shortly pubescent branchlets. Leaves opposite, distinctly petioled, cordate-ovate, entire, cuspidate, 4–5 in. long, slightly pubescent above, more densely pubescent beneath. Cymes few-flowered, peduncled, terminal and produced from the axils of the upper leaves; branchlets and short pedicels densely hairy. Calyx densely pubescent, finally $\frac{1}{2}$ in. long; tube short, campanulate; lobes large, ovate, acute. Corolla white; tube $1\frac{1}{2}$ in. long, finely pubescent; segments obovate, subequal, $\frac{1}{4}$ in. long. Stamens twice as long as the corolla-lobes.

Lower Guinea. Angola : province of Golungo Alto, *Welwitsch*, 5648!

53. **C. Guerkei**, *Baker*. An erect shrub or small tree, with finely hairy branchlets. Leaves long-petioled, broadly cordate-ovate, 3–6 in. long, acute, entire, deeply cordate at the base, moderately firm, slightly pubescent above, densely pubescent beneath. Cymes lax, produced from the axils of the leaves, forming a small panicle; pedicels densely pubescent, sometimes 1 in. long. Calyx very pubescent, $\frac{1}{2}$ in. long; lobes ovate, acute, as long as the campanulate tube. Corolla-tube slender,

4 in. long; lobes obovate, $\frac{1}{2}$ in. long. Stamens much exserted.—*C. rotundifolium*, Gürke in Holst. Pl. Usam. Exsicc. No. 8908A, not of Oliv.

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, *Holst*, 8908A!

54. **C. zambesiaccum**, *Baker*. An erect shrub, with shortly pubescent woody branchlets. Leaves opposite, distinctly petioled, cordate-ovate, entire, cuspidate, membranous, 5–6 in. long, slightly pubescent above, more densely pubescent beneath. Cymes few-flowered, lax, long-peduncled; branchlets finely pubescent; pedicels much longer than the calyx. Calyx 1 in. long, densely pubescent; tube short, campanulate; lobes ovate, acuminate. Corolla white; tube 3 in. long, pubescent, dilated at the apex; lobes obovate, subequal, $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Stamens above 1 in. long.

Mozamb. Dist. British Central Africa: Nyasaland; Msapa, *Buchanan*, 359! and without precise locality, *Buchanan*, 332! Zambesiland, *Kirk*!

55. **C. Stuhlmanni**, *Gürke in Engl. Jahrb.* xviii. 173. A shrub, with velvety branchlets. Leaves distinctly petioled, orbicular or broadly ovate, $2\frac{1}{2}$ –5 in. long, acute or cuspidate, entire, velvety on both sides. Cymes peduncled, axillary or forming a terminal panicle; bracts small, linear or subulate. Calyx campanulate, velvety, $\frac{3}{4}$ in. long, 5-partite nearly to the base; lobes ovate-lanceolate, acuminate. Corolla-tube 3 in. long, slender, incurved; lobes unequal. Stamens and style very long.

Mozamb. Dist. German East Africa: Karagwe; Ihangiro, *Stuhlmann*, 916, Lake Ikimba, 3500 ft., *Stuhlmann*, 1631, and Lake Weranyange, 4000 ft., *Stuhlmann*, 1777.

56. **C. Poggei**, *Gürke in Engl. Jahrb.* xviii. 171. A tree or shrub. Leaves long-petioled, ovate-orbicular, cordate, acuminate, 8–10 in. long, 5–6 in. broad, repand and strongly toothed, thinly hairy on both sides. Inflorescence a compact panicle formed of dense sessile cymes; pedicels long; bracts lanceolate, pubescent, above $\frac{1}{2}$ in. long. Calyx campanulate, 1 in. long; tube very short; lobes lanceolate, very acuminate. Corolla white; tube curved, 4–5 in. long; lobes unequal. Stamens very long.

Nile Land. British East Africa: Lendu Plateau, 4500 ft., *Stuhlmann*, 2702, 2710.

South Central. Congo Free State: Lualaba Dist.; in a Kalebue village, *Pogge*, 1116.

57. **C. thyrsoideum**, *Baker*. A climbing shrub with stems 25 ft. long; branchlets glabrous. Leaves opposite, shortly petioled, oblong, entire, cuspidate, deltoid at the base, 6–9 in. long by half as broad, moderately firm, green and glabrous on both surfaces. Cymes lax, few-flowered, forming a leafless thyrsoid panicle 8–12 in. long, with glabrous branchlets; pedicels nearly as long as the calyx. Calyx glabrous, $\frac{1}{4}$ in. long; tube narrowly funnel-shaped; lobes ovate, much shorter than the tube. Corolla-tube straight, slender, glabrous, above an inch long;

lobes oblong, subequal, $\frac{1}{8}$ in. long. Stamens twice as long as the corolla-lobes.

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1715!

58. **C. myricoides**, *R. Br.*; *Vatke in Linnæa*, xliii. 535, An erect shrub 3–5 ft. high, with glabrous or pubescent branchlets. Leaves 2–4-nate, subsessile, oblong, acute, deeply toothed, cuneate and entire at the base, 2–6 in. long, membranous, glabrous above, finely pubescent beneath. Cymes lax, few-flowered, forming a short terminal panicle; branchlets glabrous or finely pubescent. Calyx glabrous, $\frac{1}{8}$ in. long, and broad; tube campanulate; lobes short, ovate, obtuse, foliaceous. Corolla-tube very short; upper lobes obovate, white, $\frac{1}{2}$ in. long; lower obovate-cuneate, spoon-shaped, $\frac{3}{4}$ in. long, usually pale blue. Stamens arcuate, $\frac{3}{4}$ –1 in. long. Carpels oblong, black, glabrous.—Engl. Hochgebirgsfl. Trop. Afr. 356. *Cyclonema myricoides*, *Hochst.*; *Schauer in DC. Prod.* xi. 675; *Hook. in Bot. Mag.* t. 5838; *A. Rich. Tent. Fl. Abyss.* ii. 171; *Oliv. in Trans. Linn. Soc.*, xxix. 133.

Upper Guinea. Lagos; interior, *Rowland*!

Nile Land. Eritrea: Keren, 4500 ft., *Beccari*, 296! Mount Kube, 6000 ft., *Schweinfurth & Riva*, 1518! Galabat: Matamma, *Schweinfurth*, 41! Abyssinia: Tigre; Mount Sholoda, near Adowa, *Schimper*, 330! Samen; Shoata Valley, *Schimper*, 1140! Ghuba Valley, *Steudner*, 1311! Shoa; Ankober, *Roth*, 469! 471! Aliu Amba, *Roth*, 470! and without precise locality, *Plowden*! British East Africa: Jur; Jur Ghattas, *Schweinfurth*, 1892! Kich; at Ador village, *Petherick*! Moru; Neangara, *Petherick*! banks of the White Nile, *Petherick*! Ruwenzori; in Wimi Valley, 7000 ft., *Scott-Elliot*, 7927! Nandu; Nzowi (Nzoia) River, 4000–6000 ft., *Scott-Elliot*, 6684! Uganda, *Scott-Elliot*, 7141! Taita; Ndi Mountain, *Scott-Elliot*, 6192!

Lower Guinea. Lower Congo: Boma, *Monteiro*! Angola, *Welwitsch*, 5699! 5703! 5704! 5707! 5725! Malange, *Marques*, 10!

South Central. Congo Free State: Bolobo, on the River Congo, *Johnston*!

Mozamb. Dist. German East Africa: Usui, *Speke & Grant*, 203! Unyamwezi; Msalala, *Hannington*! and without precise locality, *Speke & Grant*! *Kirk*! Portuguese East Africa: mouth of the Kongone River, *Kirk*! British Central Africa: Nyasaland; Masuka Plateau, 6500–7000 ft., *Whyte*! Shire Highlands, *Scott-Elliot*, 8589! Zomba, *Whyte*, 83! 99! Manganja Hills, *Waller*!

Also in Natal.

Var. *discolor*, *Baker*. Branches very pubescent. Leaves pubescent on both sides, densely hairy beneath. Calyx pubescent.—*Cyclonema discolor*, *Klotzsch in Peters, Reise Mossamb. Bot.* 262.

Nile Land. Uganda; *Wilson*, 138!

Lower Guinea. Angola, *Welwitsch*, 5700!

Mozamb. Dist. German East Africa: Usambara; Heboma, *Holst*, 2571! Kilimanjaro: at 7000 ft., *Johnston*, 95! and at Marangu, 4700 ft., *Volkens*, 226! Portuguese East Africa: Rios de Sena, *Peters*! British Central Africa: Nyasaland; Blantyre, *Buchanan*, 33! near Mount Sochi, 3000 ft., *Kirk*! Mount Malosa, *Whyte*! Mount Mlanji, *Whyte*! Rhodesia: Leshumo Forest, *Holub*!

Var. *floribundum*, *Baker*. Whole plant glabrous. Leaves long, lanceolate. Cymes forming a lax, thyrsoid panicle, a foot or more long.

Nile Land. British East Africa: Niamniam; at Gumango Hill, *Schweinfurth*, 3887!

59. **C. alatum**, *Gürke in Engl. Jahrb.* xviii. 182. An erect herb, with stout tetragonous narrowly winged glabrous stems. Leaves opposite, sessile, oblanceolate, acute, glabrous, the lower nearly 1 ft. long, $1\frac{1}{2}$ in. broad above the middle, sharply toothed in the upper third. Cymes lax, many-flowered, peduncled, forming a thyrsoïd terminal panicle 1 ft. long; branchlets glabrous. Calyx glabrous, $\frac{1}{8}$ in. long; tube campanulate; lobes ovate, obtuse. Corolla-tube very short; limb white outside, pale lilac inside; lower lobe deep violet, with two white blotches in the middle.

Nile Land. British East Africa: Niamniam; near Tuhami's Seriba, *Schweinfurth*, 3796!

60. **C. Neumayeri**, *Vatke in Linnæa*, xliii. 535. A much-branched shrub 15–16 ft. high, with glabrous woody branchlets. Leaves opposite, shortly petioled, oblong, acute or obtuse, cuneate at the base, entire or crenate at the middle, $1-1\frac{1}{2}$ in. long, moderately firm, glabrous. Cymes axillary, peduncled, few-flowered; pedicels much longer than the calyx. Calyx glabrous, $\frac{1}{8}$ in. long and broad; tube campanulate; teeth small, suborbicular. Corolla-tube very short; limb lilac, nearly 1 in. in diam.; lowest lobe produced. Drupe globose, $\frac{1}{4}$ in. diam., deeply 4-lobed.—*Engl. Hochgebirgsfl. Trop. Afr.* 357.

Nile Land. British Somaliland: Ahl Mountains, near Maid, 3000–5800 ft., *Hildebrandt*, 1522! *Wardie, Miss Edith Cole! Mrs. Lort-Phillips!*

I strongly suspect this is only a shrubby montane variety of *C. myricoides*.

61. **C. Kalbreyeri**, *Baker*. A shrub, with very slender glabrous branchlets. Leaves opposite, oblong, shortly petioled, entire, acute, membranous, 3–4 in. long, glabrous on both sides, deltoid or broadly rounded at the base. Cymes few-flowered, lax, forming a short terminal panicle; branchlets glabrous. Calyx glabrous, $\frac{1}{8}-\frac{1}{4}$ in. long and broad; tube campanulate; lobes ovate, obtuse, foliaceous. Corolla-tube very short; limb $\frac{1}{2}$ in. long; lower lobes longer than the others and spoon-shaped. Stamens an inch long. Fruit deeply lobed, $\frac{1}{4}$ in. diam.

Upper Guinea. Lagos: Yoruba, *Millson!* Cameroons: Cameroon Mountain, *Kalbreyer*, 94!

62. **C. carnosulum**, *Baker*. A climbing shrub, with pubescent branches. Leaves opposite, petioled, cordate-ovate or suborbicular, entire, rather fleshy, 3–4 in. long, slightly pubescent above, densely pubescent beneath. Cymes few-flowered, long-peduncled, produced from the axils of the reduced upper leaves, so as to form a very lax terminal panicle. Calyx pubescent, $\frac{1}{6}$ in. long and broad; tube campanulate; teeth short, broad. Corolla violet; tube short; lowest lobe $\frac{1}{2}$ in. long. Stamens 1 in. long.

Lower Guinea. Angola: Province of Pungo Andongo, *Welwitsch*, 5701! 5702! 5706!

63. **C. bukobense**, *Gürke in Engl. Jahrb.* xviii. 182. A shrub, with glabrous branchlets. Leaves ovate, acuminate, glabrous, deeply

serrate upwards, the lower 4–5 in. long, $1\frac{1}{2}$ –2 in. broad, narrowed to a petiole, the upper entire with a cordate base and sessile. Cymes axillary, few-flowered, long-peduncled; bracts filiform, minute. Calyx campanulate, pubescent, $\frac{1}{8}$ in. long, cut down nearly to the middle; lobes orbicular. Corolla-tube curved, $\frac{1}{3}$ – $\frac{1}{2}$ in. long; lobes ovate, obtuse. Stamens long.

Mozamb. Dist. German East Africa: Karagwe; Bukoba, *Stuhlmann*, 3657, 3834.

64. **C. ternatum**, *Schinz in Abhandl. Bot. Ver. Brundenb.* xxxi. 205. An undershrub, with slender pubescent woody branches. Leaves sessile, ternate, obovate-cuneate, $1\frac{1}{2}$ –2 in. long, subacute, irregularly toothed in the upper half, moderately firm, glabrous above, slightly pubescent beneath. Cymes few-flowered, produced from the axils of the upper reduced leaves; pedicels short. Calyx campanulate, pubescent, $\frac{1}{8}$ in. long; teeth small, ovate. Corolla-tube cylindrical, erect, $\frac{5}{8}$ – $\frac{3}{4}$ in. long; limb $\frac{1}{4}$ in. long.

Lower Guinea. Amboland: Olukonda, *Schinz*.

Mozamb. Dist. German East Africa: Kilimanjaro; below Marangu, 3500 ft., *Volkens*, 2132!

65. **C. sansibarense**, *Gürke in Engl. Jahrb.* xviii. 181. A shrub, with branchlets pubescent upwards. Leaves shortly petioled, oblong, narrowed or rounded to the base, 4 in. long by half as broad, entire, membranous, glabrous on both surfaces. Cymes few-flowered, axillary, long-peduncled; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in. long; bracts subulate, minute. Calyx turbinate, subglabrous, $\frac{1}{4}$ in. long; lobes ovate, obtuse, reflexed, as long as the tube. Corolla-tube curved, glabrous, $\frac{1}{2}$ in. long; lobes lanceolate, obtuse, pubescent outside, rather longer than the tube. Filaments longer than the lobes, tomentose at the base.

Mozamb. Dist. Tumbatu Island, and Zanzibar, at Kokotoni, *Stuhlmann*, 511. German East Africa: Usambara; Lutindi, *Holst*, 3319!

66. **C. lanceolatum**, *Gürke in Engl. Jahrb.* xviii. 181. A perennial herb or low shrub, with an offensive smell and pubescent branchlets. Leaves 2–3-nate, sessile, oblanceolate or oblanceolate-oblong, acute, 2–3 in. long, toothed in the upper half, cuneate and entire in the lower half, pubescent, especially beneath. Cymes few-flowered, produced from the axils of the reduced upper leaves; peduncles short, very hairy. Calyx very hairy, $\frac{1}{8}$ in. long; teeth very small, ovate. Corolla white; tube sometimes above 1 in. long; lateral lobes small, orbicular; lower obovate-cuneate, $\frac{1}{3}$ in. long. Stamens $\frac{3}{4}$ in. long.

Nile Land. British East Africa: Taita; Mwatate, 2000 ft., *Johnston*!

Mozamb. Dist. Portuguese East Africa: Lower Zambesi, Sena, *Kirk*! Shupanga, *Kirk*! Lower Shire Valley, *Kirk*! *Waller*! British Central Africa: Boruma, on the Zambesi, *Menyharth*, 970! Nyasaland; Zomba and vicinity, 2500–3500 ft., *Whyte*! Shire Highlands, *Scott-Elliot*, 8577! and without precise locality, *Buchanan*, 468!

67. **C. aurantiacum**, *Baker*. An erect perennial herb, with finely pubescent stems. Leaves opposite, small, sessile, lanceolate, pubescent on both sides, inciso-crenate at the middle, cuneate and entire at the base. Cymes many-flowered, crowded, sessile, forming a long terminal panicle. Calyx pubescent, $\frac{1}{6}$ in. long; tube campanulate; lobes orbicular, obtuse, about as long as the tube. Corolla light orange; tube very short.

Mozamb. Dist. British Central Africa: Nyasaland; Manganja Hills, *Meller!*

68. **C. macrostachyum**, *Baker in Kew Bulletin*, 1898, 159. An undershrub, with stout erect woody glabrous stems. Leaves sessile, oblanceolate-oblong, the lower 3–4 in. long, obtuse, crenate in the upper half, narrowed gradually from the middle to the base, dark green, slightly pubescent, especially beneath. Cymes dense, many-flowered, sessile or the lower shortly peduncled, forming a lax panicle 6–8 in. long; bracts linear or lanceolate, foliaceous. Calyx pubescent; tube campanulate, $\frac{1}{8}$ in. long; lobes ovate or oblong, unequal, finally $\frac{1}{4}$ in. long. Corolla and stamens not seen.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Zomba, 2500–3500 ft., *Whyte!*

69. **C. spinescens**, *Gürke in Engl. Jahrb.* xviii. 180. A shrub with densely pubescent woody branchlets, often armed with small hooked or large straight spines at the nodes. Leaves opposite, suborbicular, shortly petioled, entire, pubescent, at most 1 in. long. Cymes axillary, usually reduced to a single flower; peduncle very pubescent. Calyx densely hairy, $\frac{1}{6}$ in. long; tube campanulate; teeth ovate, acute, rather shorter than the tube. Corolla tube twice as long as the calyx; upper segments oblong, $\frac{1}{2}$ in. long; lower obovate-cuneate, $\frac{3}{4}$ in. long. Stamens 1 in. long.—*Cyclonema spinescens*, *Oliv. in Journ. Linn. Soc.* xv. 96 and in *Hook. Ic. Pl.* t. 1221. *Kalaharia spinipes*, *Baill. Hist. Plant.* xi. 111. *K. spinescens*, *Gürke in Engl. Pfl. Ost-Afr. C.* 340; *Henriques in Bolet. Soc. Brot.* xvi. 69.

Lower Guinea. Lower Congo: Stanley Pool, *Hens*, 57! Angola, Huilla to Humpata, *Johnston!* between the rivers Quihumbo and Lukembe, *Marques*, 342.

South Central. Congo Free State: Upper Congo; Katanga, *Cornet*, Lualaba River, *Descamps*; Lunda; at Kimbundu, on the River Lovo, *Pogge*, 547.

Mozamb. Dist. German East Africa: Unyamwezi; Lake Shai, on the Upper Wala River, *Stuhlmann*, 438; Gondo, *Bohm & Reichardt*, 161; Lake Tanganyika, *Cameron!* British Central Africa; Urungu; Fwambo, *Carson*, 32! Kambole, 5000 ft., *Nutt!* Nyasaland; Maravi country, in Upper Shire, *Kirk!* Ngamiland; between Kobis and North Shaw Valley, *Baines!* Damaraland and Namaqualand, *Fleck*, 230, *Nels*, 30, and *Schinz*, 456 (ex *Gürke*).

Imperfectly known species.

70. **C. triflorum**, *Vis.*; *Schauer in DC. Prod.* xi. 672. Branches subtetragonous, canescent. Leaves long-petioled, broadly ovate, strongly toothed at the middle, with the ribs of the underside raised. Peduncles axillary. Cymes drooping, about 3-flowered; lateral pedicels bracteolate.

Calyx pentagonal; lobes lanceolate. Corolla-tube three times the length of the calyx; lobes elliptic.

Nile Land. Nubia, *Visiani*.

11. **HOLMSKIOLDIA**, Retz.; Benth. et Hook. f. Gen. Pl. ii. 1156.

Calyx spreading widely from a short urceolate base, very accrescent, obscurely 5-lobed. Corolla-tube incurved, dilated upwards; limb oblique, patent with 5 unequal short lobes. Stamens 4, didynamous, affixed low down in the corolla-tube, exserted; anthers ovoid, with parallel cells. Ovary entire or obscurely 4-lobed, 4-celled; ovules solitary, attached laterally. Style long, exserted, bifid at the apex. Drupe enclosed in the urceolate base of the persistent calyx-tube, truncate or lobed; mesocarp thin; endocarp of 1-4 bony pyrenes. Seed oblong, exalbuminous; testa membranous.—Erect shrubs with opposite entire or toothed leaves. Cymes axillary or terminal; bracts small, deciduous. Fruit-calyx sometimes brightly coloured.

One other species in India, and a doubtful one in Madagascar.

Branches unarmed 1. *H. tettensis*.

Branches spinous.

Leaves narrowed to the base 2. *H. spinescens*.

Leaves rounded at the base 3. *H. mucronata*.

1. **H. tettensis**, *Vatke in Linnæa*, xliii. 536. An erect shrub, with unarmed pubescent branchlets. Leaves obovate, 1-1½ in. long, entire or furnished with 1-2 large teeth on each side, cuneate at the base, thinly pubescent above, densely pubescent beneath; petiole short. Cymes few-flowered, terminal on the branchlets; pedicels long, pubescent. Calyx pubescent, finally rigidly coriaceous, 1 in. diam. Corolla pubescent externally; tube short; limb sub-bilabiate. Stamens much exserted. Fruit densely villous, deeply 4-lobed at the apex.—*Cyclonema tettense*, *Klotzsch in Peters, Reise Mossamb. Bot.* 261.

Mozamb. Dist. Portuguese East Africa: Tete, *Peters*; between Lupata and Tete, *Kirk*! British Central Africa: Nyasaland; by the River Shire, *Kirk*!

2. **H. spinescens**, *Vatke in Linnæa*, xliii. 536. A much-branched erect shrub; branches armed with woody subulate spines; young branchlets densely pubescent. Leaves oblong-cuneate, acute, entire, 1-1½ in. long, slightly pubescent above, densely pubescent beneath; petiole very short. Cymes lax, few-flowered, terminal on the branchlets. Calyx ½-¾ in. diam. in the flowering stage, finally an inch broad, rigidly coriaceous. Corolla ½ in. long, densely pubescent externally. Stamens reaching to the tip of the corolla-lobes. Fruit densely villous, deeply 4-lobed at the apex.—*Cyclonema spinescens*, *Klotzsch in Peters, Reise Mossamb. Bot.* 262.

Mozamb. Dist. Portuguese East Africa: in the lower part of the Zambesi valley, near Tete, *Peters, Kirk*!

3. **H. mucronata**, *Vatke in Linnæa*, xliii. 536. An erect shrub with spine-pointed short branchlets. Leaves ovate, shortly cuspidate, 1-3 in. long, rounded at both ends, sometimes cordate at the base, thinly pubescent above, densely pubescent beneath; petiole short. Cymes axillary, peduncled, pubescent; bracts broadly ovate, villous, deciduous. Calyx coloured, pilose on both sides, at first $\frac{1}{4}$ - $\frac{1}{3}$ in., finally $\frac{3}{4}$ in. diam. Corolla-tube very short, pubescent; limb sub-bilabiate. Ovary villous at the apex.—*Cyclonema mucronatum*, Klotzsch in Peters, *Reise Mossamb. Bot.* 260.

Mozamb. Dist. Portuguese East Africa: Rios de Sena, *Peters*.

12. **VITEX**, Linn.; Benth. et Hook. f. *Gen. Pl.* ii. 1154.

Calyx campanulate or funnel-shaped, 5-toothed or nearly truncate, accrescent. Corolla-tube short or long, subcylindric or funnel-shaped, straight or slightly curved; limb obliquely patent, sub-bilabiate. Stamens 4, didynamous, inserted in the corolla-tube and usually exerted from it; anther-cells nearly parallel or divergent. Ovary at first imperfectly 2-celled, usually finally 4-celled; ovules solitary, laterally attached; style filiform, bifid at the apex. Drupe with a more or less fleshy mesocarp and a hard 4-celled endocarp. Seeds obovate or oblong, exalbuminous.—Trees or shrubs, with glabrous or hairy branches. Leaves opposite, usually compound, digitate, rarely simple. Cymes dichotomous, axillary or forming a terminal panicle. Flowers whitish, yellowish, lilac or blue.

Species 100, mostly inhabiting the tropical zone in both hemispheres. The African oak or teak, mentioned under *Vitex*, by Bentham, in Hooker's *Niger Flora*, 487, is now known from full material, and proves to belong to Euphorbiaceæ (*Oldfieldia africana*, Hook. f.)

*Panicle thyrsoïd.

Leaves simple.

Petiole very short 1. *V. chrysoclada*.

Petiole not very short 2. *V. sulphurea*.

Leaves 3-foliolate 3. *V. Strickeri*.

Leaves, at least the larger, 5-foliolate.

Leaflets sessile.

Leaflets 4 times as long as broad 4. *V. zanzibarensis*.

Leaflets twice as long as broad 5. *V. Volkensii*.

Leaflets stalked.

Leaflets white beneath 6. *V. Negundo*.

Leaflets green beneath.

Leaflets toothed 7. *V. Buchanani*.

Leaflets entire 8. *V. thyrsoïflora*.

**Panicle corymbose.

†Leaves usually simple, large, ovate (see also 23 and 24).

Leaves hairy beneath 9. *V. Vogelii*.

Leaves glabrous beneath.

Leaves cuneate at the base 10. *V. gomphophylla*.

Leaves rounded at the base.

Fruit-calyx $\frac{1}{2}$ in. diam. 11. *V. syringæfolia*.

Fruit-calyx $\frac{1}{3}$ in. diam. 12. *V. simplicifolia*.

†† Leaves usually 3-foliolate.

End-leaflet ovate.

Leaflets small.

Pubescence grey 13. *V. petersiana*.Pubescence pale brown 14. *V. tettensis*.Leaflets 2-3 in. long 15. *V. dentata*.

End-leaflet oblong.

Cymes lax 16. *V. Kirkii*.

Cymes dense.

Leaflets sessile.

Calyx-teeth minute 17. *V. polyantha*.Calyx-teeth not minute 18. *V. flavescens*.Leaflets stalked 19. *V. tangensis*.

End-leaflet obovate-cuneate.

Calyx-teeth distinct, $\frac{1}{2}$ lin. long at flowering.Leaves glabrous beneath 20. *V. madiensis*.

Leaves pubescent beneath.

Leaves coriaceous 21. *V. Schweinfurthii*.Leaves not coriaceous 22. *V. zambesiaca*.

Calyx-teeth minute.

Upper leaves simple in part.

Leaves finely pubescent beneath 23. *V. holocalyx*.Leaves densely matted beneath 24. *V. diversifolia*.

Upper leaves 3-foliolate.

Leaves glabrous beneath 25. *V. doniana*.Leaves slightly pubescent beneath 26. *V. barbata*.Leaves densely pubescent beneath 27. *V. Camporum*.

††† Leaves usually 5-foliolate.

Leaflets not distinctly stalked.

Leaves glabrous beneath.

Leaflets small 28. *V. micrantha*.Leaflets very large 29. *V. grandifolia*.

Leaves pubescent beneath.

Leaves thinly pubescent beneath.

Pubescence brown 30. *V. ferruginea*.

Pubescence grey.

Leaflets small 31. *V. angolensis*.

Leaflets medium-sized.

Leaflets acute 32. *V. grisea*.Leaflets obtuse 33. *V. chrysocarpa*.Leaflets large 34. *V. æsculifolia*.

Leaves densely matted beneath.

Pubescence whitish, woolly 35. *V. Hildebrandtii*.

Pubescence grey, not woolly.

Leaflets small 36. *V. Mombassæ*.Leaflets medium-sized 37. *V. shirensis*.

Leaflets distinctly stalked.

§ Leaves glabrous beneath.

Leaflets toothed.

Leaflets 3-4 in. long 38. *V. Carvalhi*.Leaflets 6-8 in. long 39. *V. oxycuspis*.

Leaflets entire.

Leaves not coriaceous.

Leaflets 2-3 in. long 40. *V. oligantha*.

- Leaflets 5-7 in. long 41. *V. Dewevrei*.
 Leaflets 8-9 in. long 42. *V. gabunensis*. —
 Leaves coriaceous.
 Leaflets small 43. *V. divaricata*.
 Leaflets large.
 Calyx ferrugineo-tomentose 44. *V. lundensis*.
 Calyx finely pubescent.
 Calyx teeth obscure 45. *V. pachyphylla*.
 Calyx teeth small, distinct.
 Corolla-tube as long as the calyx . 46. *V. cuneata*.
 Corolla-tube longer than the calyx 47. *V. Cienkowskii*.
 Calyx teeth half as long as the tube . 48. *V. Poggei*.
 §§ Leaves more or less pubescent beneath.
 Leaves bearded in the axils of the veins beneath 49. *V. mossambicensis*.
 Leaves finely pubescent beneath.
 Leaflets medium-sized.
 Leaflets very acuminate.
 Stalk of leaflets short 50. *V. Welwitschii*.
 Stalk of leaflets long 51. *V. amboniensis*.
 Leaflets acute 52. *V. andongensis*.
 Leaflets subacute 53. *V. lævigata*.
 Leaflets obtuse 54. *V. puberula*.
 Leaflets large.
 Flower-calyx $\frac{1}{2}$ in. long 55. *V. golungensis*.
 Flower-calyx $\frac{1}{8}$ in. long 56. *V. milanjiensis*.
 §§§ Leaves densely hairy beneath.
 Pubescence of leaf grey 57. *V. Fischeri*.
 Pubescence of leaf ferruginous 58. *V. Buchneri*.

1. **V. chrysoclada**, Bojer; Schauer in DC. Prod. xi. 694. A shrub about a yard high; branchlets densely clothed with short stiff drab or brown hairs. Leaves simple, shortly petioled, oblong or obovate-oblong, acute or cuspidate, entire or crenate, 2-3 in. long, thinly pubescent above, densely pubescent beneath, with raised brown main veins. Cymes forming a short dense terminal panicle; branchlets densely pubescent; bracts large, linear, villous. Flower-calyx campanulate, pubescent, $\frac{1}{2}$ in. long; teeth minute. Corolla pubescent, twice as long as the calyx. Drupe the size of a pea.—Engl. Hochgebirgsfl. Trop. Afr. 357. *Premna zanzibarensis*, Vatke in Linnæa, xliii. 531; Gürke in Engl. Pfl. Ost-Afr. C. 338.

Nile Land. British East Africa: Mombasa Island, Bojer! Ribe, Wakefield!

Mozamb. Dist. German East Africa: Usaramo; Bagamoyo, Kirk! Dar-es-salaam, Hildebrandt, 1167A! Usambara; Tanga, Holst, 2178! Volkens, 160! Amboni, Holst, 2570! Kilimanjaro, 5000 ft., Johnston!

2. **V. sulphurea**, Baker. A shrub or small tree; branchlets pubescent. Leaves simple, opposite, distinctly petioled, oblong or obovate-oblong, entire, acute, moderately firm, green and finely pubescent on the main ribs on both sides when mature, 3-5 in. long. Cymes forming an ample lax thyrsoid terminal panicle; branches densely clothed with short stiff drab pubescence; bracts lanceolate. Flower-calyx campanu-

late, densely pubescent, $\frac{1}{16}$ in. long; teeth distinct, ovate. Corolla sulphur-yellow, $\frac{1}{8}$ in. long. Fruit the size of a small pea.

Lower Guinea. Angola: in the provinces of Pungo Andongo and Golungo Alto, *Welwitsch*, 5663! 5677! 5735! 5736!

3. **V. Strickeri**, *Vatke & Hildebr. in Linnæa*, xliii. 532. A shrub 5–6 ft. high; branchlets densely clothed with short brown pubescence. Leaves trifoliolate, subcoriaceous, scabrous above, densely pubescent with raised main veins beneath; leaflets ovate, acute, $1\frac{1}{2}$ –2 in. long, entire or slightly toothed, end one shortly petioled; main petiole densely pubescent, 1 in. long. Cymes forming a thyrsoid terminal panicle 2–4 in. long; branches very pubescent; pedicels very short. Calyx campanulate, pubescent, minutely toothed, $\frac{1}{12}$ in. long at flowering. Corolla pubescent, twice as long as the calyx. Drupe yellow, glossy, glabrous, the size of a pea.

Mozamb. Dist. German East Africa: Usaramo; Dar-es-Salaam, *Hildebrandt*, Bagamoyo, *Kirk*!

Nile Land. British East Africa: Mombasa, *Wakefield*!

4. **V. zanzibarensis**, *Vatke in Linnæa*, xliii. 533. A shrub 4–5 yards high; branchlets shortly pubescent. Leaves 3–5-foliolate, moderately firm, green and glabrous on both surfaces; leaflets 3–5, sessile, oblong-lanceolate, acuminate, entire, narrowed to the base, 3–4 in. long, 1 in. broad at the middle; petiole $1\frac{1}{2}$ –2 in. long. Cymes laxly disposed on the branches of an ample panicle; branchlets clothed with short whitish pubescence; bracts lanceolate, minute. Calyx campanulate, $\frac{1}{16}$ in. long and broad at flowering, canescent; teeth 5, minute. Corolla lilac, densely pubescent, $\frac{1}{4}$ in. long; tube funnel-shaped; lobes very small.

Mozamb. Dist. German East Africa: Bagamoyo, *Hildebrandt*, 1303!

5. **V. Volkensii**, *Gürke in Engl. Pfl. Ost-Afr. C.* 339. A tree; branchlets clothed with yellowish hairs. Leaves with a long petiole, 5-foliolate; leaflets subsessile, oblong, acute, entire, moderately firm, slightly pubescent above, densely pubescent beneath; central one 3–4 in. long. Cymes forming an ample terminal thyrsoid panicle; branches densely pubescent; pedicels short. Calyx campanulate, pubescent, $\frac{1}{16}$ – $\frac{1}{12}$ in. long; teeth small, deltoid. Corolla-tube pubescent, twice as long as the calyx; lobes small, orbicular. Stamens included.

Mozamb. Dist. German East Africa: Usambara; Nderema, *Volkens*, 132!

6. **V. Negundo**, *Linn.*; *Schauer in DC. Prod.* xi. 684. A shrub or small tree; branchlets coated with white tomentum. Leaves 5-foliolate, moderately firm, green and glabrous above when mature, coated with thin persistent whitish tomentum beneath; leaflets 5, oblong-lanceolate, entire, acute, rounded at the base, 3–4 in. long, 1 in. broad, the three upper long-petioled; main petiole $1\frac{1}{2}$ –2 in. long.

Cymes forming a dense terminal panicle, with white branchlets; bracts lanceolate, minute. Flower-calyx campanulate, canescent, $\frac{1}{8}$ in. long and broad; teeth very minute. Corolla lavender-blue, $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Drupe the size of a small pea.—Vatke in *Linnaea*, xliii. 533; Wight, *lc. t.* 519; C. B. Clarke in *Hook. f. Fl. Brit. Ind.* iv. 583.

Mozamb. Dist. German East Africa: Usaramo; Dar-es-salaam, *Hildebrandt*, 1254!

Also in Tropical Asia and Madagascar.

7. **V. Buchanani**, *Baker in Buchanan, Nyasaland plants*, 1891, 15 (*name only*), and *ex Gürke in Engl. Pfl. Ost-Afr.* C. 339. Branches clothed with dense drab pubescence. Leaves long-petioled, 5-foliolate; leaflets oblong, usually acute, entire or obscurely dentate, cuneate at the base, pubescent on both sides, especially beneath; central leaflet 2–3 in. long, distinctly petioled. Cymes forming an ample thyrsoid panicle, with densely pubescent branches. Calyx campanulate, $\frac{1}{2}$ in. long; teeth small, deltoid. Corolla-tube cylindrical, less than twice as long as the calyx; lobes small, orbicular. Stamens not protruding beyond the corolla-lobes.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Malosa, 4000–6000 ft., *Whyte!* plains of Zomba, 2500–3000 ft., *Whyte!* and without precise locality, *Buchanan*, 318! 385! 782!

8. **V. thyrsoiflora**, *Baker in Kew Bulletin*, 1895, 152. A tree; branchlets glabrous. Leaves long-petioled, 5-foliolate; leaflets distinctly stalked, obovate-oblong, cuspidate, almost membranous, green and glabrous on the upper surface, pale and slightly pubescent beneath, end one 6–8 in. long and 3–3½ in. broad at the middle. Cymes forming an ample thyrsoid terminal panicle; pedicels short, pubescent; bracts small, linear. Calyx campanulate, $\frac{1}{3}$ in. long; teeth small, deltoid. Corolla-tube twice the length of the calyx; lobes oblong. Stamens included.

Upper Guinea. Lagos: Abeokuta, *Harrison*, 5! in the interior, without precise locality, *Rowland!*

9. **V. Vogelii**, *Baker*. A small tree 15 ft. high; branchlets clothed with short whitish pubescence. Leaves in whorls of 3, simple, oblong, entire, acute, subcuneate or rather rounded at the base, 4–5 in. long, half as broad, subcoriaceous, green, and finally glabrous above, matted all over beneath with persistent whitish pubescence; petiole 2 in. long. Cymes axillary, peduncled, few-flowered. Flowers not seen. Fruit-calyx $\frac{1}{3}$ in. diam.; obscurely lobed. Drupe globose, the size of a cherry.

Upper Guinea. Southern Bornu; Musgu, *Vogel*, 97!

10. **V. gomphophylla**, *Baker*. A tree; branchlets glabrous. Leaves long-petioled, simple, obovate-cuneate, 2–4 in. long, entire, minutely cuspidate, moderately firm, green and glabrous on both surfaces. Cymes lax, few-flowered, lateral, shortly peduncled. Calyx

campanulate, coriaceous, glabrous, subentire, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam. Corolla not seen.

Upper Guinea. Sierra Leone : Dantilia, on a laterite plateau, 3000–4000 ft. *Scott-Elliott*, 5389!

11. **V. syringæfolia**, *Baker in Kew Bulletin*, 1895, 115. A shrub; branches glabrous. Leaves long-petioled, simple, oblong, acute, entire, rounded at the base, 3–4 in. long, 2–2½ in. broad, green and glabrous on both surfaces. Cymes sessile, axillary, many-flowered. Fruit-calyx $\frac{1}{4}$ in. long, green, glabrous; teeth small, ovate. Corolla-tube short, cylindrical; lobes oblong, as long as the tube.

Upper Guinea. Interior of Western Lagos, *Rowland*!

12. **V. simplicifolia**, *Oliv. in Trans. Linn. Soc.* xxix. 133, t. 130, *not of C.B. Clarke*. A small tree; branchlets woody, glabrous. Leaves simple, ternate, oblong, obtuse or minutely cuspidate, rounded at the base, 6 in. long, 4 in. broad, subcoriaceous, glabrous and rather glossy above, pubescent all over beneath; petiole glabrous, 2 in. long. Cymes few-flowered, axillary, peduncled. Flowers not seen. Fruit-calyx $\frac{1}{3}$ in. diam., obscurely toothed. Drupe oblong, the size of a sloe.

Nile Land. British East Africa : Madi, *Speke & Grant*, 701/5!

An allied plant gathered by Welwitsch in Angola in the province of Golungo Aito, has occasionally two small accessory leaflets on the lower leaves of the branch. It is a shrub 6–8 ft. high.

13. **V. petersiana**, *Klotzsch in Peters, Reise Mossamb. Bot.* 264. Branchlets clothed with grey pubescence. Leaves 3-foliolate; leaflets ovate, acute, inciso-crenate, bright green above, paler beneath; central one 1 in. long. Cymes axillary at the apex of the branchlets, shortly peduncled, pubescent, with a flower on a short pedicel at the fork; bracts small, linear, villous. Calyx cyathiform, pubescent, 5-dentate. Corolla pubescent, twice as long as the calyx.

Mozamb. Dist. Portuguese East Africa : Lower Zambesi, at Tete, *Peters*.

14. **V. tettensis**, *Klotzsch in Peters, Reise Mossamb. Bot.* 264. Branchlets clothed with pale brown pubescence. Leaves 3-foliolate, crowded at the apex of the branchlets; leaflets ovate, petioled, shortly cuspidate, more or less serrate, $\frac{3}{4}$ –1 in. long, glabrous above, pubescent on the ribs beneath. Cymes peduncled, few-flowered, axillary from the end of the branchlets. Calyx cyathiform, 4–5-toothed, sparsely pubescent. Corolla cylindrical, sparsely pubescent outside. Drupe globose, the size of a pea.

Mozamb. Dist. Portuguese East Africa : Lower Zambesi, at Tete, *Peters*.

15. **V. dentata**, *Klotzsch in Peters, Reise Mossamb. Bot.* 265. Branchlets villous with white hairs. Leaves remote, 3-foliolate; leaflets

ovate, petioled, shortly cuspidate, furnished with a few large teeth, 2–2½ in. long, half as broad, bright green and glabrous above, pale beneath with a hairy midrib. Cymes axillary, peduncled; branchlets pubescent; bracts linear, pubescent. Calyx campanulate, sparsely pubescent, with 5 very acute teeth. Corolla hairy, three times the length of the calyx. Drupe small, obovoid.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi, at Tete, *Peters!*

16. **V. Kirkii**, *Baker*. A shrub or small tree; branchlets finely pubescent. Leaves trifoliolate, moderately firm, green and glabrous above, pubescent beneath; leaflets shortly petioled, oblong, obtuse, entire, end one 1–1½ in. long; main petiole under 1 in. long. Cymes very lax-flowered, axillary, often 2–3-nate from the apex of the branchlets; pedicels pubescent; bracts linear, minute. Calyx campanulate, pubescent, ½ in. long; teeth minute, deltoid. Corolla pink, ½ in. long; lower lip much longer than the upper. Drupe globose, the size of a large pea.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; Tete, *Kirk!*
British Central Africa: Northern Zambesia; Boruma, *Menyharth*, 872!

17. **V. polyantha**, *Baker*. A shrub or small tree; branchlets short, clothed with short drab pubescence. Leaves 3-foliolate, moderately firm, dark green and glabrous above when mature, paler and pubescent all over beneath; leaflets oblong, acute, entire, sessile, 1–1½ in. long; main petiole slender, 1–2 in. long. Cymes very numerous, axillary, shortly peduncled, congested; pedicels densely hairy, very short. Calyx campanulate, densely pubescent, ½ in. long, minutely toothed. Corolla small, very pubescent.

Nile Land. British East Africa: Mombasa, *Wakefield!*

18. **V. flavescens**, *Rolfe in Bolet. Soc. Brot.* xi. 87. A shrub; branchlets densely pubescent. Leaves long-petioled, trifoliolate; leaflets oblong, obtuse, sessile, entire, 2–3 in. long, densely pubescent, especially beneath. Cymes axillary, long-peduncled, few-flowered; branches pubescent; bracts minute. Calyx campanulate, pubescent, ¼ in. long; teeth deltoid, acute. Corolla-tube twice as long as the calyx; lobes small, orbicular. Stamens much longer than the lobes.—*V. Mechowii*, *Gürke in Engl. Jahrb.* xviii. 167; *Henriques in Bolet. Soc. Brot.* xvi. 69.

Lower Guinea. Angola, *Welwitsch*, 5731! Malange, in pastures, *Mechow*, 247, *Marques*, 8!

19. **V. tangensis**, *Gürke in Engl. Pfl. Ost-Afr. C.* 339. A shrub 15–20 ft. high; branchlets clothed with yellowish hairs. Leaves distinctly petioled, 3-foliolate; leaflets distinctly stalked, oblong-lanceolate, 2–3 in. long, acute or acuminate, entire, glabrous above, pubescent and dotted beneath. Cymes dense, axillary, peduncled; pedicels pubescent; bracts lanceolate. Calyx campanulate, clothed with yellowish pubes-

cence; teeth short, broad, acute. Corolla-tube twice the length of the calyx. Stamens exserted. Fruit globose, glabrous, 1 in. or more in diam.

Mozamb. Dist. German East Africa: Usambara; Tanga, *Volkens*, 92.

20. **V. madiensis**, *Oliv. in Trans. Linn. Soc.* xxix. 134, t. 131. A tree; branchlets pubescent or villous when young. Leaves usually 3-foliolate, sometimes simple or 5-foliolate, subcoriaceous, green and glabrous above when mature, hairy especially on the main ribs beneath; leaflets obovate-cuneate, obtuse or cuspidate, deeply crenate in the upper half, reaching a length of 5–6 in. by half as broad, end one distinctly stalked; main petiole 3–4 in. long. Cymes dense, axillary, long-peduncled; branchlets densely hairy; pedicels very short. Calyx campanulate, densely hairy, $\frac{1}{8}$ in. long and broad; teeth ovate, distinct. Corolla twice as long as the calyx, hairy outside. Fruit edible, the size of a small plum.—*V. Schweinfurthii*, *Gürke in Engl. Jahrb.* xviii. 170.

Nile Land. British East Africa: Jur; Kurshook Ali's Seriba, *Schweinfurth*, ser. 3, 48! Jur Ghattas, *Schweinfurth*, 1365! 1506! 2030! Denka territory, at Jeranil, *Schweinfurth*, 1313! Madi, *Speke & Grant*, 649! Mittu; near Mvolo, *Schweinfurth*, 2848.

21. **V. Schweinfurthii**, *Baker*. A tree; branchlets stout, woody, terete, clothed with short soft drab pubescence. Leaves subcoriaceous, 3-foliolate or simple, glabrous above when mature, pubescent all over beneath with raised main veins; leaflets obovate-cuneate, entire, obtuse or minutely cuspidate; end leaflet shortly stalked, reaching 5–6 in. long by half as broad; main petiole 2–3 in. long. Cymes lax, axillary, peduncled; branchlets densely pubescent; bracts large, linear. Calyx campanulate, $\frac{1}{8}$ in. long, densely pubescent; teeth 5, ovate, distinct. Corolla small, villous outside. Fruit oblong, the size of a small plum, with a calyx $\frac{1}{2}$ in. diam.

Nile Land. British East Africa: Denka Territory; Lao district, *Schweinfurth*, 1303! Jur; Jur Ghattas, *Schweinfurth*, 1953! Gir, *Schweinfurth*, 1519!

22. **V. zambesiaca**, *Baker*. A large tree; branchlets stout, angular, densely clothed with short whitish pubescence. Leaves 3-foliolate, thin, green and obscurely pubescent on the upper surface, densely matted all over with whitish tomentum beneath when young, more thinly when mature; leaflets sessile, obovate-cuneate, obtuse, entire, end one 4–5 in. long by half as broad; main petiole 3–4 in. long. Cymes axillary, many-flowered, dense, long-peduncled; branchlets densely pubescent. Calyx campanulate, densely pubescent, $\frac{1}{8}$ in. long; teeth ovate, acute. Corolla twice as long as the calyx. Drupe the size of a plum, edible.

Mozamb. Dist. Portuguese East Africa: Lower Shire; near the base of Morambala Mountain, *Kirk*!

23. **V. holocalyx**, *Baker*. A shrub 6–8 ft. high; branchlets densely pubescent. Leaves 3-foliolate or simple, subcoriaceous, obscurely

pubescent above when mature, finely pubescent all over beneath; leaflets suborbicular when simple, obovate-cuneate when the leaf is compound, entire or crenate, end one 2-3 in. long by half as broad; main petiole 2-3 in. long. Cymes axillary, lax, long-peduncled. Calyx campanulate, densely pubescent, nearly $\frac{1}{8}$ in. long, entire at the throat. Corolla small, densely hairy outside. Fruit unknown.

Lower Guinea. Angola: province of Golungo Alto, *Welwitsch*, 5636!

24. **V. diversifolia**, *Baker*. A small tree; branchlets densely clothed with short whitish pubescence. Leaves 3-foliolate or simple, subcoriaceous, green and obscurely pubescent above when mature, densely matted beneath when young and less distinctly so when mature; leaflets obovate-cuneate or when solitary suborbicular, entire; end leaflet shortly stalked, 4-5 in. long, more than half as broad; main petiole 2-3 in. long. Cymes axillary, long-peduncled; branchlets densely villous; pedicels very short. Calyx campanulate $\frac{1}{8}$ in. long, densely villous; teeth minute. Corolla small, very hairy outside. Fruit globose, the size of a small cherry or plum, with a calyx $\frac{1}{2}$ in. diam.

Upper Guinea. Lagos: Yoruba district, *Barter*, 1096! Niger Territory: Nupe, *Barter*, 1644!

25. **V. doniana**, *Sweet*, *Hort. Brit. ed. i.* 323. Branchlets very stout, obscurely pubescent. Leaves 3-foliolate, subcoriaceous, glabrous on both sides; leaflets obovate-cuneate, entire, obtuse or minutely cuspidate; end leaflet shortly stalked, 3-4 in. long, half as broad; main petiole 3-4 in. long. Cymes very compound, very dense, axillary, shortly peduncled; branchlets pubescent; pedicels short. Calyx campanulate, pubescent, $\frac{1}{8}$ in. long; teeth small, deltoid. Corolla pubescent, 2-3 times the length of the calyx. Fruit not seen.

Upper Guinea. Senegal, *Heudelot*, 379!

26. **V. barbata**, *Planch. MS. in Herb. Kew.* A tree; young branchlets densely clothed with fine spreading hairs. Leaves 3-foliolate, subcoriaceous, green and glabrous above when mature, slightly pubescent on the main ribs beneath; leaflets obovate-cuneate, entire, shortly stalked, obtuse, end one 3-4 in. long and half as broad; main petiole $2\frac{1}{2}$ -3 in. long. Cymes copious, axillary, dense, long-peduncled; branchlets villous; pedicels very short. Calyx campanulate, densely villous, $\frac{1}{8}$ in. long; teeth very short. Corolla 2-3 times the length of the calyx. Fruit the size of a cherry.

Upper Guinea. Senegal, *Heudelot*, 30! Senegambia, *Heudelot*! Sierra Leone, Talla hills, in bush half way up Gonkwi, *Scott-Elliot*, 4881!

27. **V. Camporum**, *Bütttn. in Verhandl. Bot. Ver. Brandenb.* xxxii. 35. A tree; branchlets densely pubescent. Leaves long-stalked, 3-foliolate, subcoriaceous, subglabrous above when mature, densely pubescent beneath; leaflets obovate-cuneate, minutely cuspidate, crenate above the middle, end one $2\frac{1}{2}$ -3 in. long and shortly stalked. Cymes

dense, long-peduncled, axillary; branchlets and short pedicels densely hairy; bracts linear-subulate. Flower-calyx campanulate, very hairy, $\frac{1}{8}$ in. long; teeth obscure. Corolla-tube as long as the calyx; lobes of the limb small, very hairy outside.—Henriques in Bolet. Soc. Brot. xvi. 69.

Upper Guinea. Sierra Leone: near Falaba, *Scott-Elliott*, 5189!

Lower Guinea. Lower Congo, *Laurent!* near Tondoa (Underhill), *Büttner*, 428. Angola: San Salvador, *Büttner*, 427! Malange, in pastures, *Marques*, 10!

28. **V. micrantha**, *Gürke in Engl. Jahrb.* xviii. 170. A small tree; branchlets glabrous. Leaves 5-foliolate, moderately firm, green and glabrous on both surfaces; leaflets obovate-cuneate, entire, subsessile, conspicuously cuspidate, end one 2 in. long by less than half as broad; main petiole slender, glabrous, $1\frac{1}{2}$ –2 in. long. Cymes few-flowered, long, axillary, distinctly peduncled; branchlets glabrous. Calyx campanulate, thinly pubescent, $\frac{1}{12}$ in. long; teeth very small. Corolla small, white, silky outside. Fruit-calyx $\frac{1}{8}$ in. diam.—Cummins in *Kew Bulletin*, 1898, 76.

Upper Guinea. Sierra Leone: Bagru River, *Mann*, 860! Ashanti: Assin-yan-Coomassie, *Cummins*, 74!

29. **V. grandifolia**, *Gürke in Engl. Jahrb.* xviii. 169. A small tree; branchlets glabrous. Leaves 5-foliolate, moderately firm, green and glabrous on both surfaces; leaflets obovate-cuneate, obtuse or cuspidate, entire, nearly sessile, end one 8–12 in. long and half as broad. Cymes dense, axillary, shortly peduncled; branchlets finely pubescent. Calyx campanulate, pubescent, obscurely toothed, $\frac{1}{8}$ in. long. Corolla yellowish, silky outside, 3–4 times the length of the calyx. Fruit the size of a small plum, edible, with a calyx $\frac{1}{2}$ in. diam.

Upper Guinea. Sierra Leone: Bagru River, *Mann*, 880! Gold Coast; by the River Volta, *Rumsey*, 14! Lagos, *Barter*, 20180! *Millen*, 32! 64! Interior of Western Lagos, *Rowland!* Niger Delta: sea shore near the River Nun, *Barter*, 2098! Cameroons: Bipinde, *Zenker*, 839! 959! 1006!

Lower Guinea. Gaboon: Munda; Sibange Farm, *Soyaux*, 215! Augoni, 70 miles east of Gaboon, *Bates*, 550!

Native name 'Ore.' Fruit, a sort of black plum, from which is made rum, said to be intoxicating (*Millen*).

30. **V. ferruginea**, *Schumach. & Thonn.*; *Schauer in DC. Prod.* xi. 695. A tree 20–25 ft. high; branchlets clothed with soft ferruginous pubescence. Leaves 5–7-foliolate, moderately firm, glabrous and bright green when mature, clothed all over beneath with soft ferruginous pubescence; leaflets obovate-cuneate, entire, obtuse or cuspidate, nearly or quite sessile, end one 3–4 in. long by half as broad; main petiole 4–5 in. long, densely pubescent. Cymes very compound, axillary, long-peduncled; branches clothed with short soft brown pubescence. Flower calyx $\frac{1}{12}$ in. long, densely pubescent; teeth small. Corolla small, pubescent outside. Fruit globose, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam.—*V. rufescens*, *Gürke in Engl. Jahrb.* xviii. 169.

Upper Guinea. Gold Coast: Aquapim Mountains, *Thonning!*

Lower Guinea. Angola: in the province of Golungo Alto, *Welwitsch*, 5632! 5665!

Vitex congolensis, De Wild. & Durand in *Comptes-rendus Soc. Bot. Belg.* xxxviii. 134, is not separable from *V. ferruginea*, Schumach. & Thonn., by the description. It was collected by Dewèvre at Bokakata in the northern part of the Congo Free State.

31. **V. angolensis**, *Gürke in Engl. Jahrb.* xviii. 167. A tree; branchlets densely pubescent. Leaves 5-foliolate, moderately firm, green and obscurely pubescent above when mature, paler and pubescent all over beneath; leaflets oblong-cuneate, obtuse, entire, nearly sessile, end one $1\frac{1}{2}$ in. long by $\frac{1}{2}$ in. broad; main petiole $1\frac{1}{2}$ –2 in. long. Cymes axillary, shortly peduncled, few-flowered. Calyx campanulate, densely pubescent, $\frac{1}{8}$ in. long, distinctly toothed. Corolla-tube twice as long as the calyx; lobes short. Fruit the size of a large pea.

Lower Guinea. Angola: province of Huilla, 3800–5500 ft., *Welwitsch*, 5758!

32. **V. grisea**, *Baker*. A tree; branchlets densely clothed with short drab pubescence. Leaves usually 5-foliolate, subcoriaceous, obscurely pubescent above when mature, finely pubescent all over beneath; leaflets oblong-cuneate, entire, acute, subsessile; end leaflet 3–4 in. long, $1-1\frac{1}{4}$ in. broad at the middle; main petiole 2–3 in. long. Cymes dense, axillary, shortly peduncled; branches and peduncle densely pubescent. Calyx campanulate, densely pubescent, $\frac{1}{12}$ in. long; teeth deltoid, distinct. Corolla small, hairy outside. Fruit not seen.

Lower Guinea. Angola: province of Huilla, 3800–5500 ft., *Welwitsch*, 5759!

33. **V. chrysocarpa**, *Planch. ex Benth. in Hook. Niger Fl.* 486. A shrub or small tree; branchlets shortly pubescent. Leaves subcoriaceous, 3–5-foliolate, green and glabrous above when mature, densely coated all over with drab pubescence beneath; leaflets obovate-cuneate, entire or crenate, obtuse; end leaflet shortly stalked, 3–4 in. long, half as broad; main petiole pubescent, 2–3 in. long. Cymes peduncled, axillary, few-flowered; branchlets villous. Calyx campanulate, densely villous, $\frac{1}{8}$ in. long; teeth ovate, distinct. Corolla light blue, hairy, 3 times the length of the calyx. Fruit as large as a plum.

Upper Guinea. French Guinea: by the River Niger at Farana, *Scott-Elliot*, 5383! Niger Territory: banks of the River Niger at its confluence with the River Benue, *Barter*, 388! and in Nupe, *Barter*, 1214! 1651! River Niger (Quorra), *Vogel*, 142!

34. **V. æsculifolia**, *Baker*. A tree 30 ft. high; branchlets densely clothed with short brown pubescence. Leaves 5-foliolate, subcoriaceous; green and obscurely pubescent above, finely pubescent all over beneath; leaflets obovate-cuneate, acute, all quite sessile, entire; end leaflet 5–6 in. long, half as broad; main petiole 3–4 in. long. Cymes axillary, peduncled, with pubescent branchlets. Flowers not seen. Fruit oblong, $\frac{1}{3}$ in. long, with a shortly-toothed pubescent calyx $\frac{1}{4}$ in. diam.

South Central. Congo Free State: Monbuttu; near Munza, *Schweinfurth*, 3442!

35. **V. Hildebrandtii**, *Vatke in Linnæa*, xliii. 534. A tree; branchlets short, densely pilose. Leaves long-petioled, 5-foliolate; leaflets sessile, oblong, 2-4 in. long, obtuse, narrowed to the base, entire, green and thinly pubescent above, densely matted with white pubescence beneath. Cymes long-peduncled, dense, axillary; branches densely pubescent; pedicels very short; bracts linear, villous. Calyx campanulate, densely pubescent, $\frac{1}{8}$ in. long; teeth ovate. Corolla-tube a little longer than the calyx, very hairy; lobes oblong. Stamens not exerted.

Mozamb. Dist. German East Africa: Usaramo; Dar-es-Salaam, *Hildebrandt*, 1249; Usambara; Tanga, *Volkens*, 1! *Holst*, 2101! British Central Africa: Nyasaland, *Buchanan*, 118!

36. **V. Mombassæ**, *Vatke in Linnæa*, xliii. 533. A shrub or small tree; branchlets densely pubescent. Leaves 3-5-foliolate, coriaceous, green and thinly pubescent above when mature, densely pubescent all over beneath; leaflets obovate, quite sessile, entire, obtuse or cuspidate, end one 2-3 in. long by half as broad; main petiole 1-1 $\frac{1}{2}$ in. long, densely pubescent. Cymes dense, axillary, shortly peduncled, corymbose or thyrsoid; branches densely pubescent. Calyx campanulate, densely pubescent, $\frac{1}{8}$ in. long; teeth large, ovate. Corolla yellowish, more than twice as long as the calyx, pubescent outside. Fruit as large as a plum, with a calyx $\frac{3}{4}$ in. diam.

Nile Land. British East Africa: near Mombasa, *Hildebrandt*, 1972! *Kirk*!

Mozamb. Dist. German East Africa: Kilimanjaro, 5000 ft., *Johnston*! Usambara; Bombuera, *Holst*, 2196.

37. **V. shirensis**, *Baker*. A small tree, with densely pubescent branchlets. Leaves 5-foliolate, coriaceous, green and glabrous above when mature, pubescent beneath; leaflets obovate-cuneate, obtuse, entire, sessile, end one 3 in. long by more than half as broad; main petioles 3-4 in. long. Cymes axillary, peduncled, few-flowered; branches densely pubescent; bracts oblong. Calyx campanulate, densely pubescent, $\frac{1}{8}$ in. long; teeth ovate, distinct. Corolla small, very hairy outside. Fruit the size of a small plum.

Mozamb. Dist. British Central Africa: Nyasaland; Impembe Hill, 3000 ft. *Kirk*, 3! Shire Highlands, *Buchanan*, 20! Zomba and vicinity, 2500-3500 ft. *Whyte*! and without precise locality, *Buchanan*, 231!

38. **V. Carvalhi**, *Gürke in Engl. Pfl. Ost-Afr. C.* 339. A shrub or tree; branchlets glabrous. Leaves 5-foliolate; petiole very long; leaflets distinctly stalked, elliptical or lanceolate-obovate, 3-4 in. long, acute or cuspidate, irregularly deeply toothed, membranous, glabrous on both surfaces. Cymes lax, axillary, with a very long peduncle. Calyx campanulate, tomentose, 5-toothed. Corolla-tube pubescent.

Mozamb. Dist. Portuguese East Africa: Mozambique, *Carvalho*!

39. **V. oxycuspis**, *Baker*. A small tree 15-20 ft. high; branchlets glabrous. Leaves 3-5-foliolate, membranous, green and glabrous on both sides; leaflets obovate-cuneate, irregularly crenate, with a large

linear-cusp, distinctly stalked, end one 6–8 in. long by less than half as broad; main petiole 2–3 in. long. Cymes lax, long-peduncled, axillary; branchlets glabrous. Flower-calyx campanulate, glabrous, $\frac{1}{2}$ in. long; teeth short, deltoid. Corolla glabrous, 3 times the length of the calyx. Fruit unknown.

Upper Guinea. Niger Territory: Old Calabar River, *Mann*, 2243!

40. **V. oligantha**, *Baker*. A shrub; branchlets slender, pale, glabrous. Leaves 5-foliolate, membranous, green and glabrous on both surfaces; leaflets oblong, acute, entire, all distinctly stalked, end one 2–3 in. long by half as broad; main petiole slender, glabrous, $1\frac{1}{2}$ –2 in. long. Cymes axillary, peduncled, very lax, few-flowered; branches very slender, glabrous. Calyx campanulate, glabrous, $\frac{1}{2}$ in. long; teeth very short and broad. Corolla-tube twice as long as the calyx; limb nearly as long as the tube. Fruit unknown.

Mozamb. Dist. German East Africa: on the coast at Quiloa (Kilwa) *Kirk*, 108! Kilwa, *Kirk*!

41. **V. Dewevrei**, *De Wild. & Durand in Comptes-rendus. Soc. Bot. Belg.* xxxviii. 133. A tree 40–50 ft. high; branchlets glabrous or rufo-pubescent. Leaves long-petioled, 5-foliolate; leaflets oblong, shortly stalked, 4–7 in. long, $1\frac{1}{2}$ –2 in. broad, abruptly acuminate, narrowed to the base, entire, shining above, glabrous or subglabrous beneath. Cymes supra-axillary, peduncled; branches pubescent; bracts oblong-lanceolate; flowers sessile, bi-bracteolate. Calyx campanulate, 5-toothed, tomentose, $\frac{1}{8}$ in. long; teeth small, deltoid, acute. Corolla not seen. Fruit globose, black, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam.

Lower Guinea. Lower Congo: Lukungu, *Dewèvre*.

42. **V. gabunensis**, *Gürke in Engl. Jahrb.* xviii. 167. A shrub 3–4 ft. high; branchlets glabrous. Leaves 5-foliolate, moderately firm, green and glabrous on both surfaces; leaflets oblong-cuneate, entire, all distinctly stalked, end one 8–9 in. long by less than half as broad. Cymes sparse, shortly peduncled. Flowers not seen. Fruit globose, the size of a large pea, with a nearly entire calyx $\frac{1}{4}$ in. diam.

Lower Guinea. Gaboon: Munda; Sibange Farm, *Soyaux*, 163!

43. **V. divaricata**, *Baker*. A shrub or small tree; branchlets glabrous. Leaves 5-foliolate, sub-coriaceous, glabrous on both sides; leaflets obovate-cuneate, entire, obtuse, all distinctly stalked, end one 3 in. long and half as broad; main petiole 2 in. long. Cymes long-peduncled, axillary, with long divaricate main branches; branchlets finely pubescent. Calyx campanulate, pubescent, $\frac{1}{2}$ in. long; teeth very small. Corolla small, silky outside. Fruit unknown.

Upper Guinea. Fernando Po, *Milne*!

44. **V. lundensis**, *Gürke in Engl. Jahrb.* xviii. 168. A shrub; branchlets glabrous. Leaves long-petioled, 5-foliolate; leaflets dis-

tinctly stalked, oblong-lanceolate, 7–8 in. long. 2–2½ in. broad, acute, narrowed to the base, entire, coriaceous, glabrous on both surfaces. Cymes long-stalked, lax, axillary; pedicels short; bracts subulate. Calyx $\frac{1}{6}$ – $\frac{1}{4}$ in. long, ferrugino-tomentose; teeth short, deltoid. Corolla white, ferrugino-tomentose outside; tube twice the length of the calyx. Stamens scarcely exerted.

South Central. Lunda: River Lulua, *Pogge*, 1260.

45. **V. pachyphylla**, *Baker*. A tree; branchlets glabrous. Leaves 5-foliolate, very rigid, green and glabrous on both surfaces, with main veins much raised beneath; leaflets obovate-cuneate, obtuse or acute, entire, all distinctly stalked, end one 4–5 in. long and half as broad; main petiole 2–3 in. long. Cymes axillary, long-peduncled, dense, many-flowered; branchlets pubescent. Calyx campanulate, pubescent, $\frac{1}{8}$ in. long; teeth very small. Corolla small, silky outside. Fruit the size of a small plum.

Lower Guinea. Gaboon: banks of the Gaboon River, *Mann*, 994!

46. **V. cuneata**, *Schumacher & Thonn.*; *Schauer in DC. Prod.* xi. 694. A tall tree; branchlets glabrous, tetragonal. Leaves 5-foliolate, coriaceous, glabrous on both sides; leaflets obovate-cuneate, entire, all distinctly stalked, end one reaching a length of 6–7 in. Cymes axillary, long-peduncled. Calyx campanulate, pubescent, shortly 5-toothed. Corolla scarlet, pubescent; tube as long as the calyx, densely bearded at the throat. Fruit as large as a plum, blackish, edible.

Upper Guinea. "Guinea," *Thonning*.

47. **V. Cienkowskii**, *Kotschy & Peyr. Pl. Tinn.* 27, t. 12. A tall tree reaching a height of 50 ft.; branchlets glabrous. Leaves 5-foliolate, coriaceous, glabrous on both sides; leaflets obovate-cuneate, entire, obtuse or slightly cuspidate, all distinctly petioled, end one 4–6 in. long and half as broad; main petiole 2–3 in. long. Cymes dense, axillary, long-peduncled; branchlets slightly pubescent; pedicels very short. Calyx campanulate, pubescent, $\frac{1}{8}$ in. long; teeth deltoid. Corolla yellowish-brown, 3 times the length of the calyx, pubescent outside. Fruit the size of a large cherry, edible.—*V. paludosa*, *Vatke in Linnæa*, xliii. 534.

Upper Guinea. French Guinea: common by the River Niger at Farana, *Scott-Elliott*, 5211! Lagos, *Millen*, 118! Niger Territory: Nupe, very common, *Barter*, 1108! Ilorin, *Rowland*! Southern Bornu: Musgu, *Vogel*, 67!

Nile Land. Upper Sennar: Fazokl, *Cienkowsky*. British East Africa: at the confluence of the Ghazal River and the White Nile, *Heuglin*; Denka Territory, *Schweinfurth*, 1307! Jur; Jur Ghattas, *Schweinfurth*, 1890! Madi, abundant, *Speke & Grant*, 81! Usoga, *Scott-Elliott*, 7179!

Lower Guinea. Congo, *Smith*! Angola: province of Golungo Alto, *Welwitsch*, 5633! 5645! 5746!

Mozamb. Dist. Zanzibar, *Kirk*, 1! *Hildebrandt*, 1123! Lake Tanganyika, *Cameron*! Portuguese East Africa: banks of the Luabo River, *Kirk*, 40! British

Central Africa : Nyasaland; Magomero, *Meller*, 5! Lake Nyasa, *Kirk*! Shire Highlands, *Buchanan*, 80! Karonga, *Scott*!

"Fruit the size of a cherry; black plum of Sierra Leone, 'Edi' of Nupe; edible." (Barter).

48. **V. Poggei**, *Gürke in Engl. Jahrb.* xviii. 168. A shrub, with glabrous branchlets. Leaves long-stalked, 5-foliolate; leaflets shortly stalked, oblong; end leaflet 6-7 in. long, 2-2½ in. broad, acute or acuminate, coriaceous, quite glabrous on both surfaces. Cymes long-peduncled, axillary, lax, few-flowered; pedicels short; bracts linear. Calyx campanulate, pubescent, ¼ in. long; teeth deltoid, half as long as the tube. Drupe globose, pubescent at the apex.

Tropical West Africa. Without locality, probably from Lunda or Angola, *Pogge*, 1255.

49. **V. mossambicensis**, *Gürke in Engl. Pfl. Ost-Afr. C.* 340. A shrub or tree. Leaves long-petioled, 5-foliolate; leaflets shortly stalked, ovate, 1½-2½ in. long, acuminate, rounded at the base, entire, membranous, glabrous above, bearded in the axils of the veins beneath. Cymes with a long peduncle, lax, axillary. Calyx tubular-campanulate, minutely toothed, pubescent upwards. Corolla-tube short; upper lip bearded.

Mozamb. Dist. Portuguese East Africa: Mozambique, *Carvalho*.

50. **V. Welwitschii**, *Gürke in Engl. Jahrb.* xviii. 166. A small tree, 12-20 ft. high; branchlets clothed with short pubescence. Leaves 5-foliolate, moderately firm, green and glabrous above when mature, finely pubescent beneath; leaflets obovate-cuneate, entire, conspicuously cuspidate, shortly stalked, end one 3-4 in. long by half as broad; main petiole 2-3 in. long. Cymes dense, axillary, many-flowered, shortly peduncled. Calyx campanulate, ⅓ in. long, densely pubescent. Corolla small, violet. Fruit unknown.

Lower Guinea. Angola: in the province of Golungo Alto, *Welwitsch*, 5644!

51. **V. amboniensis**, *Gürke in Engl. Pfl. Ost-Afr. C.* 340. A shrub; branchlets clothed with yellowish hairs. Leaves long-petioled, 5-foliolate; leaflets long-stalked, oblong-lanceolate, 2-3½ in. long, very acuminate, narrowed to the base, entire, glabrous above, pubescent and gland-dotted beneath. Fruit ellipsoid, 1 in. long, mucronate, glabrous, spotted with white.

Mozamb. Dist. German East Africa: Usambara; Amboni, *Holst*, 2578! Portuguese East Africa: between Lupata and Tete, *Kirk*, 2! British Central Africa: Boruma, on the Zambesi, *Menyharth*, 762!

52. **V. andongensis**, *Baker*. A tree; branchlets clothed with short drab pubescence. Leaves 5-foliolate, subcoriaceous, green and glabrous above when mature, clothed all over with drab pubescence beneath; leaflets oblong, acute, entire, all distinctly stalked, end one

4 in. long and 2 in. broad at the middle; main petiole 3–4 in. long. Cymes axillary, shortly peduncled; branches very pubescent. Calyx campanulate, $\frac{1}{2}$ in. long, densely clothed with pale drab pubescence; teeth obscure. Corolla small, very hairy outside. Fruit not seen.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5696!

53. **V. lævigata**, *Baker*. A tree, with white bark; branchlets finely pubescent. Leaves 5-foliolate, subcoriaceous, green and glabrous above when mature, pale green and finely pubescent all over beneath; leaflets oblong-cuneate, entire, subacute, all distinctly stalked, end one 3–4 in. long by half as broad; main petiole 3–4 in. long. Cymes axillary, shortly peduncled. Flowers not seen. Fruit the size of a small plum, with a shortly-toothed calyx $\frac{1}{2}$ in. diam.

Mozamb. Dist. German East Africa: Usaramo; Dar-es-Salaam, *Kirk*!

54. **V. puberula**, *Baker*. A tree; branchlets clothed with short drab pubescence. Leaves coriaceous, 5-foliolate, green and glabrous above when mature, pubescent beneath; leaflets obovate-cuneate, entire, obtuse, distinctly stalked, end one 3 in. long and half as broad; main petiole 2–3 in. long. Cymes dense, axillary, shortly peduncled; branches finely pubescent. Calyx campanulate, pubescent, $\frac{1}{2}$ in. long; teeth deltoid, distinct. Corolla small. Fruit not seen.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5668!

55. **V. golungensis**, *Baker*. A shrub 8–12 ft. high; branchlets clothed with short pubescence. Leaves moderately firm, 5-foliolate, green and obscurely pubescent on both sides when mature; leaflets obovate-cuneate, entire, obtuse or cuspidate, all distinctly stalked, end one 5–6 in. long by half as broad; main petiole 5–6 in. long. Cymes dense, axillary, long-peduncled; branches clothed with adpressed pubescence. Calyx campanulate, pubescent, $\frac{1}{2}$ in. long; teeth deltoid, distinct. Corolla small. Fruit not seen.

Lower Guinea. Angola: province of Golungo Alto, *Welwitsch*, 5635!

56. **V. milanjiensis**, *Britten in Trans. Linn. Soc. ser. 2, Bot. iv. 36*. A shrub; branchlets finely pubescent. Leaves long-petioled, 5-foliolate; leaflets shortly-stalked, obovate-oblong, 3–6 in. long, obtuse, emarginate, cuneate at the base, entire, moderately firm, green and pubescent on both surfaces. Cymes long-peduncled, dense, axillary; branches pubescent; bracts linear. Calyx campanulate, pubescent, $\frac{1}{2}$ in. long; teeth deltoid. Corolla pilose; tube scarcely longer than the calyx. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; Stevenson Road, 5000–6000 ft., *Scott-Elliot*, 8282! Shire Highlands, *Scott-Elliot*, 8622! Mount Zomba, *Whyte*! Mount Mlanji, *Whyte*! and without precise locality, *Buchanan*, 79! 194!

57. **V. Fischeri**, *Gürke in Engl. Jahrb. xviii. 171*. A shrub; branchlets clothed with yellow tomentum. Leaves long-petioled,

5-foliolate; leaflets distinctly stalked, oblong, 4 in. long, 2 in. broad, shortly acuminate, narrowed to the base, entire, scabrous above, tomentose beneath. Cymes long-stalked, axillary, dense; pedicels short, pubescent; bracts linear-subulate. Calyx campanulate, pubescent, $\frac{1}{8}$ – $\frac{1}{6}$ in. long; teeth very short and broad. Corolla-tube pubescent, a little longer than the calyx. Stamens scarcely exerted.

Nile Land. British East Africa; Uganda, common, *Scott-Elliott*, 7252; 7411!

Mozamb. Dist. German East Africa: Kageyi, on Lake Victoria, *Fischer*, 476! Uzinja, *Stuhlmann*, 3576; Kimsani Plateau, *Stuhlmann*, 3394; Mwanza, *Stuhlmann*, 4137, 4184.

58. **V. Buchneri**, *Gürke in Engl. Jahrb.* xviii. 166. A shrub; branches finely tomentose upwards. Leaves long-petioled, 5-foliolate; leaflets very shortly stalked, obovate, 4–5 in. long, apex shortly cuspidate, narrowed to the base, pubescent above, densely ferruginotomentose beneath. Cymes long-stalked, axillary, lax; branches ferruginotomentose; pedicels long; lower bracts lanceolate. Calyx campanulate, $\frac{1}{6}$ in. long; teeth lanceolate-deltoid, acute. Corolla-tube rather longer than the calyx; anticous lobe cuneate, deeply dentate. Stamens shortly exerted.

Lower Guinea. Angola: Kassambo, *Buchner*, 574.

13. **AVICENNIA**, Linn.; Benth. et Hook. f. *Gen. Plant.* ii. 1160.

Calyx short, 5-partite, not accrescent; segments oblong, imbricate. Corolla-tube short, funnel-shaped; limb patent, usually 4-lobed, rarely 5-lobed. Stamens 4, inserted at the throat of the corolla-tube; filaments short, filiform; anthers ovoid, with parallel cells. Ovary with a 4-winged central axis, imperfectly 4-celled; cells 1-ovuled; style short, bifid at the stigmatose apex; ovules pendulous from the central axis. Fruit capsular, compressed, 2-valved. Seed by abortion usually solitary; coats of the ovule imperfectly developed; cotyledons longitudinally folded; radicle inferior, villous; plumule growing out before the seed falls, as in *Rhizophora*.—Shrubs or trees. Leaves opposite, entire, coriaceous, petioled. Flowers small, aggregated in globose heads, each flower subtended by a bract and a pair of bracteoles.

Species 3 or 4, inhabiting the tropical shores of both hemispheres.

Corolla-lobes white, pubescent inside 1. *A. africana*.

Corolla-lobes bright yellow, glabrous inside 2. *A. officinalis*.

1. **A. africana**, *P. Beauv, Fl. Owar.* i. 80, t. 47; *Schauer in DC. Prod.* xi. 699. A shrub or tree, reaching to a height of 40 ft. Leaves lanceolate or oblong-lanceolate, 3–6 in. long, 1–1 $\frac{1}{2}$ in. broad at the middle, acute or obtuse, narrowed gradually to a short petiole, very coriaceous, dull green above, clothed with thin whitish or drab tomentum beneath. Spikes produced from the axils of the leaves and forming a small terminal panicle; peduncles finely tomentose; bracts broad, ovate. $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Calyx-segments small, oblong. Corolla-lobes as long as the tube, white, pubescent on both surfaces. Style $\frac{1}{16}$ – $\frac{1}{12}$ in. long.

Fruit ovoid-cuspidate, compressed, 1–1½ in. long.—Benth. in Hook. Niger Fl. 487; Durand & De Wild. in Bull. Soc. Bot. Belg. xxxvii. 125.

Upper Guinea. Senegal: *Döllinger*, 73! *Roger*, 75! Senegambia: Island of St. Louis, *Brunner*, 1! Sierra Leone, *Mann*, vii.! *Don*! *Scott-Elliott*, 4120! Liberia: Cape Palmas, *Vogel*! Lagos, *Rowland*! Niger Delta: Brass, *Barter*, 46! Grand Bassa, *Vogel*, 101! Cameroons: Batanga, *Bates*, 195! Fernando Po, *Milne*! *Mann*, 281!

Lower Guinea. Portuguese Congo: Chinchocho, *Soyaux*, 60! Angola, *Welwitsch*, 5641! 5709! 5726! Congo; Banana marsh, *Dupuis*.

Perhaps not distinct specifically from the American *A. nitida*, Jacq.

2. ***A. officinalis***, Linn.; *Schauer* in DC. Prod. xi. 700. A shrub or small tree; branchlets clothed with thin whitish tomentum. Leaves oblong or oblong-lanceolate, 1½–3 in. long, ¾–1 in. broad at the middle, acute or obtuse, narrowed gradually to a short petiole, rigidly coriaceous, green and glabrous above, clothed with thin white tomentum beneath. Spikes globose, terminal and axillary, on short square tomentose peduncles; bracts broadly ovate, ⅛–½ in. long, margined with whitish tomentum. Corolla-lobes ovate, bright yellow, glabrous inside. Style short or scarcely any. Fruit ovoid, compressed, 1 in. long.—A. Rich. Tent. Fl. Abyss. ii. 173; *Vatke* in Linnæa, xliii. 539; *Klotzsch* in Peters, Reise Mossamb. Bot. 266; *Terracciano* in Ann. Istit. Bot. Roma, v. 101; C. B. Clarke in Hook. f. Fl. Brit. Ind. iv. 604. *A. tomentosa*, Jacq.; *Wight*, Ic. t. 1481.

Nile Land. Red Sea: Harnish Island, *Slade*, 2! Dalac Archipelago, *Steudner*, 1307! Nubia: sea coast about 21° N. latitude, *Bent*! Eritrea: Massowa, *Ehrenberg*, *Quartin-Dillon*, *Hildebrandt*, 731, *Schweinfurth* & *Riva*, 61, *Schech Said*, *Beccari*. Somaliland: Aoolaa, near Bunder Murayah, *Playfair*! Bay of Anfilah, *Terracciano*. British East Africa: Mombasa, *Wakefield*!

Mozamb. Dist. German East Africa: Usambara; Tanga, *Volkens*, 160! Muoa, *Holst*, 3059! Usaramo; Dar-es-Salaam, *Hildebrandt*, 1241! Portuguese East Africa: Zambesi Delta; mouth of the Kongone River, *Kirk*! mouth of the Luabo River, *Kirk*, 11! 45! Inbambane, *Peters*.

Also in Egypt, Natal, and the tropical shores of both hemispheres.

ORDER CII. LABIATÆ (by J. G. Baker).

Flowers hermaphrodite, irregular. Calyx inferior, gamosepalous, persistent, often accrescent; limb usually 5-toothed, sometimes bilabiate or 6–10-toothed. Corolla gamopetalous; limb usually bilabiate, 2 lobes being represented by the upper lip and 3 by the lower. Stamens epipetalous, usually 4, didynamous, sometimes reduced to 2; anthers usually 2-celled; cells parallel or divaricate, often confluent. Hypogynous disk thick and fleshy. Ovary superior, 4-lobed; style produced from the centre of the lobes, forked at the tip. Fruit of 4 nucules, usually included in the persistent calyx. Seeds solitary in the nucules, erect; albumen scanty or wanting; cotyledons flat or convex; radicle short, inferior.—Herbs or shrubs, rarely scandent; stems usually 4-angled. Leaves exstipulate, opposite or verticillate (very rarely alternate), crenate or entire, sessile or petioled, usually simple, often,

as are the other parts of the plant, furnished with glandular dots. Flowers verticillate, the two cymes which form the whorl usually congested into umbels; bracts minute or large and foliaceous; pedicels often bracteolate.

Species about 3000. Cosmopolitan.

TRIBE I. **Ocimoideæ**.—*Stamens declinate.*

Calyx-tube not closely ribbed.

Lower lip of the corolla small, and not very concave.

Corolla-tube short. Style bifid at the tip.

Upper tooth of the calyx decurrent.

Upper tooth of calyx not wrapped round the others in fruit 1. OCIMUM.

Upper tooth of calyx wrapped round the others in fruit 2. ERYTHROCHLAMYS.

Upper tooth of calyx not decurrent.

Whorls of flowers separated.

Calyx with 2 entire lips 3. PLATYSTOMA.

Calyx 5-toothed.

Calyx accrescent 4. GENIOSPORUM.

Calyx not accrescent 5. MOSCHOSMA.

Whorls congested into a dense capitulum 6. ACROCEPHALUS.

Corolla-tube long. Style not bifid 7. ORTHOSIPHON.

Lower lip of the corolla large, concave.

Lower lip of corolla not abruptly deflexed.

Stamens 2. Fruit-calyx berry-like 8. HOSLUNDIA.

Stamens 4.

Filaments free to the base.

Fruit-calyx, not circumscissile, very large, accrescent 9. ALVESIA.

Fruit-calyx, not circumscissile, with 5 large, prickle-like teeth 10. PYCNOSTACHYS.

Fruit-calyx circumscissile above the base.

Leaves alternate 11. ICOMUM.

Leaves opposite. 12. ÆOLANTHUS.

Calyx not circumscissile, 5-toothed; teeth subequal or upper broader, not prickle-like 13. PLECTRANTHUS.

Filaments, united towards the base (see, too, *Plectranthus insolitus*).

Calyx with 2 oblong lips 14. SOLENOSTEMON.

Calyx 5-toothed.

Upper tooth ovate: 4 lower mucronate 15. COLEUS.

Upper tooth large, ovate; 4 lower small, deltoid; calyx irregularly circumscissile near the base 16. NEOMUELLEA.

Teeth ovate, subequal 17. ENGLERASTRUM.

Teeth all orbicular, very accrescent 18. CAPITANYA.

Upper tooth large, concave, deflexed; 4 lower small; calyx not circumscissile 19. ANISOCHILUS.

Lower lip of corolla abruptly deflexed 20. HYPTIS.

Calyx-tube with many close ribs 21. LAVANDULA.

TRIBE II. **Satureineæ**.—*Stamens 4 in the Tropical African genera, arcuate or divergent. Corolla-lips small, not very concave. Nucules with a small basal areole.*

Calyx with 5 subequal teeth.

Corolla not distinctly bilabiate.

Anther-cells divaricate 22. ELSHOLTZIA.

Anther-cells parallel 23. MENTHA.

Corolla distinctly bilabiate 24. MICROMERIA.

Calyx distinctly bilabiate.

Calyx-teeth large 25. THYMUS.

Calyx-teeth small 26. CALAMINTHA

TRIBE III. **Monardeseæ**.—*Stamens 2, arcuate. Upper lip of the corolla large, concave. Nucules with a small basal areole.*

Anthers 2-celled 27. MERIANDRA.

Anthers 1-celled 28. SALVIA.

TRIBE IV. **Nepeteæ**.—*Stamens 4, arcuate, the upper pair longest. Upper lip of the corolla large, concave. Nucules with a small basal areole.*

The only genus 29. NEPETA.

TRIBE V. **Stachydeæ**.—*Stamens 4, arcuate, the lower pair longest. Upper lip of corolla large, concave. Nucules with a small basal areole.*

Calyx with 2 entire lips 30. SCUTELLARIA.

Calyx 5–10-toothed, sometimes sub-bilabiate, but then lips 2- or 3- or more-toothed.

Calyx 5-toothed

Nucules scaly at the tip 31. ACHYROSPERMUM.

Nucules naked at the tip.

Disk equal.

Corolla-tube included. Calyx 5-10-ribbed 32. STACHYS.

Corolla-tube exserted. Calyx 5-ribbed 33. LAMIUM.

Disk oblique 34. LASIOCORYS.

Calyx 8-10-toothed, rarely with fewer teeth.

Calyx not bilabiate.

Stamens included in the corolla-tube 35. ACROTOME.

Stamens exserted from the corolla-tube.

Lobes of style subequal 36. BALLOTA.

Lobes of style unequal.

Lower lip of corolla long 37. LEUCAS.

Lower lip of corolla short 38. LEONOTIS.

Calyx-limb bilabiate, scariose 39. OTOSTEGIA.

TRIBE VI. **Ajugoideseæ**.—*Stamens 4, arcuate. Upper lip of corolla short. Nucules obovoid, reticulated, with a broad lateral areole.*

Calyx bilabiate, very accrescent.

Corolla-tube scarcely longer than the calyx 40. TINNEA.

Corolla-tube much longer than the calyx 41. RENSCHIA.

Calyx 5-toothed, scarcely accrescent.

Upper lip of corolla truncate 42. TEUCRIUM.

Upper lip of corolla erect, bifid 43. AJUGA.

1. **OCIMUM**, Linn.; Benth. et Hook. f. Gen. Plant, ii. 1171.

Calyx deflexed in fruit; tube usually campanulate; upper lip orbicular or ovate, the edges often decurrent; lateral lobes usually

smaller than the two mucronate lower ones. Corolla-tube not longer than the calyx; limb bilabiate, upper lip 4-lobed, lower scarcely longer, nearly flat. Stamens didynamous, declinate; filaments free, upper pair often appendiculate above, the base with a tooth or tuft of hairs; anthers 1-celled. Disk of 1-4 glands. Style shortly bifid at the apex. Nucules ovoid or subglobose, smooth or punctate.—Herbs or shrubs. Leaves usually petioled and crenate. Racemes of numerous whorls; bracts usually small and deciduous. Flowers usually white, small or of medium size.

Species 60, widely spread through the warmer regions of both hemispheres, some extensively cultivated and used for pot-herbs and medicinally.

*OCIMODON. Filaments of the upper stamens with a tooth near the base.

Annuals.

- Stem and leaves nearly glabrous 1. *O. basilicum*.
 Stem and leaves covered with fine white down 2. *O. canum*.

Perennials.

†Flowers small (corolla under $\frac{1}{2}$ in. long).

Stamens not or but little exerted.

Herbaceous.

Leaves slightly hairy.

- Racemes lax 3. *O. viride*.
 Racemes dense 4. *O. trichodon*.
 Leaves densely hairy 5. *O. suave*.

Shrubby.

- Leaves sessile, linear-lanceolate 6. *O. Stirbeyi*.
 Leaves shortly petioled, oblong 7. *O. tortuosum*.

Stamens much exerted.

Leaves lanceolate or linear.

Leaves $\frac{1}{2}$ -1 in. long.

- Leaves linear 8. *O. scoparium*.
 Leaves lanceolate 9. *O. Fischeri*.
 Leaves 3-4 in. long 10. *O. glossophyllum*.
 Leaves oblong 11. *O. menthaefolium*.

Leaves ovate or ovate-oblong.

- Calyx pubescent 12. *O. kilimand-*
scharicum.

- Calyx densely coated with white tomentum 13. *O. tomentosum*.

††Flowers large.

Herbaceous perennials.

Leaves linear.

- Whorls of flowers 1 or 2 14. *O. linearifolium*.
 Whorls of flowers many 15. *O. poggeanum*.

Leaves linear-lanceolate.

- Leaves $\frac{3}{4}$ -1 in. long 16. *O. modestum*.
 Leaves 1-2 in. long.

- Racemes short 17. *O. Stuhlmanni*
 Racemes long 18. *O. fimbriatum*.

Leaves oblong or oblong-lanceolate.

- Racemes long, lax 19. *O. affine*.
 Racemes short, dense 20. *O. Schweinfurthii*.

Undershrubs, with woody branches.

- Stems simple 21. *O. usaramense*.
 Stems much branched.
 Racemes capitate 22. *O. Descampsii*.
 Racemes not capitate 23. *O. filamentosum*.
- **HIEROCIMUM.**—Filaments of the upper stamens with a tuft
 of hairs near the base.
- Annual 24. *O. gracile*.
 Perennials.
 Flowers small.
 Leaves oblong-lanceolate 25. *O. Camporum*.
 Leaves ovate-lanceolate 26. *O. citriodorum*.
 Leaves ovate.
 Stamens not exerted.
 Fruit-calyx $\frac{1}{8}$ in. long 27. *O. Hanningtonii*.
 Fruit-calyx $\frac{1}{4}$ in. long 28. *O. Rothii*.
 Stamens slightly exerted.
 Leaves very small 29. *O. thymoides*.
 Leaves not very small 30. *O. Hildebrandtii*.
 Stamens much exerted.
 Raceme capitate 31. *O. capitatum*.
 Raceme lax 32. *O. Johnstonii*.
- Flowers large.
 Raceme short, dense 33. *O. punctatum*.
 Raceme long, lax.
 Leaves oblong or oblong-lanceolate 34. *O. knyanum*.
 Leaves ovate 35. *O. lamifolium*.
- ***GYMNOCIMUM.**—Filaments of the upper stamens without
 either a tooth or a tuft of hairs near the base.
- Annuals.
 Tube of fruit-calyx campanulate 36. *O. dichotomum*.
 Tube of fruit-calyx oblong-cylindric 37. *O. tereticaule*.
- Perennials.
 Leaves linear 38. *O. verticillifolium*.
 Leaves lanceolate 39. *O. rigidum*.
 Leaves ovate-oblong.
 Whorls few-flowered 40. *O. staminosum*.
 Whorls many-flowered 41. *O. Buchananii*.
 Leaves ovate.
 Leaves slightly hairy 42. *O. laxiflorum*.
 Leaves villous 43. *O. membranaceum*.

1. ***O. basilicum***, Linn.; Benth. in DC. Prod. xii. 32. An erect annual, with much-branched glabrous or slightly pubescent stems 1–2 ft. long. Leaves distinctly petioled, ovate, membranous, 1–2 in. long, glabrous or slightly pubescent. Racemes moderately dense, the end one finally 6–9 in. long; rhachis slightly pubescent; pedicels very short; bracts ovate, about as long as the whorls. Calyx finally $\frac{1}{4}$ in. long; upper lobe orbicular, much longer than the very short campanulate tube; lower lobes deltoid-mucronate, protruding beyond the upper. Corolla $\frac{1}{3}$ – $\frac{1}{2}$ in. long, white, or tinged more or less with purple. Stamens slightly exerted, the posticous filaments appendiculate with a tooth

above the base.—Benth. in Hook. Niger Fl. 488; Schweinf. Beitr. Fl. Aethiop. 125; Hayne, Gewachs. xi. t. 3; Hook. f. Fl. Brit. Ind. iv. 608. *O. graveolens*, A. Br. in Flora, 1841, i. 265. *O. petitianum*, A. Rich. Tent. Fl. Abyss. ii. 176.

Upper Guinea. Gambia: north bank of the River Gambia, *Ozanne!* Sierra Leone, *Don, Miss Turner!* Cape Verd Islands: St. Nicolao, *Bolle!* Lagos, *Rowland!* Fernando Po, *Vogel, 80!*

Nile Land. Nubia: Dongola, cultivated, *Ehrhenberg!* Eritrea: Mount Ghedem, near Massowa, 480–1000 ft., *Schweinfurth & Riva, 96!* Kordofan: Schitangul, *Pfund, 175!* Arashkol Mountain, *Kotschy, 197!* Ethiopia, *Kotschy, 198!* Darfur, *Purdy, 91!* Abyssinia: Chelicut, *Petit!*

Mozamb. Dist. German East Africa: Usambara; Amboni, *Holst, 2802!* Portuguese East Africa: Rios de Sena, *Peters;* Inhambane, *Scott!* Unangu to Lake Shirwa, *Johnson, 76!*

Widely spread in Tropical Asia, and often cultivated.

2. ***O. canum***, *Sims in Bot. Mag. t. 2452;* *Benth. in DC. Prod. xii. 32.* An erect much-branched annual, with densely pubescent stems 1–2 ft. long. Leaves shortly petioled, ovate or lanceolate, more or less pubescent, 1–2 in. long, entire or obscurely crenate. Racemes moderately dense, 3–6 in. long; axis very pubescent; pedicels very short; bracts small, ovate, deciduous. Calyx finally $\frac{1}{6}$ in. long; upper lobe orbicular, much longer than the hairy very short campanulate tube; lateral lobes minute; two lower deltoid, mucronate, protruding beyond the upper. Corolla white, $\frac{1}{6}$ in. long. Stamens much exserted, the posticous pair appendiculate at the base.—Benth. in Hook. Niger Fl. 487; Vatke in Linnæa, xliii. 83; Schweinf. Beitr. Fl. Aethiop. 125; Oliv. in Trans. Linn. Soc. xxix. 134; Briquet in Bull. Soc. Bot. Belg. xxxvi. p. 83; Hook. f. Fl. Brit. Ind. iv. 607.

Upper Guinea. Senegambia, *Lelièvre.* Cape Verd Islands: St. Iago Island, *Hooker, 121!* Lagos: Eferin Oshu, *Moloney!* Abeokuta, *Irving, 131!* Niger Territory: Nupe, *Baikie!* Borgu, *Barter, 868!* Cameroons: Batanga, *Bates, 203!* Fernando Po, *Vogel, 32!* *Barter!*

Nile Land. Ethiopia, *Kotschy, 568!* Galabat: Matamma, *Schweinfurth, 243!* Somaliland: Boobi, *James & Thrupp!* British East Africa: Jur: Jur Ghattas, *Schweinfurth, 3019!* Moru; Neangara, *Murie!* Unyoro, *Speke & Grant!* Ukamba, 5000–6000 ft., *Scott-Elliott, 6427!* Taita; Ndara Mountain, *Hildebrandt, 3394!*

Lower Guinea. Lower Congo: Lukungu, *Hens, 393.* Angola, *Welwitsch, 5566! 5567! 5569! 5570! 5574! 5583! 5617!*

South Central. Congo Free State: Mombuttu; Munza, *Schweinfurth, 3391!* between Lusambo and the Lomami River, *Laurent.*

Mozamb. Dist. German East Africa: Usambara; Amboni, *Holst, 2841!* British Central Africa: Nyasaland; Monkey Bay, 1600 ft., *Whyte!* Tanganyika Plateau, at Fort Hill, *Whyte!*

Widely spread in Tropical Asia, often cultivated.

3. ***O. viride***, *Willd.;* *Benth. in DC. Prod. xii. 34.* A perennial 3–6 ft. high, with much-branched glabrous stems. Leaves distinctly petioled, oblong, acute, membranous, 3–4 in. long, glabrous on both sides, or obscurely pubescent beneath. Racemes lax, copiously

panicled, 3–6 in. long; rhachis finely pubescent; bracts deciduous; pedicels not very short. Calyx $\frac{1}{6}$ in. long; tube campanulate; upper lobe orbicular, as long as the tube; lower teeth short. Corolla half as long again as the calyx-lobes. Stamens but little exserted, the two upper with filaments toothed above the base.—Benth. in Hook. Niger Fl. 488; Henriques in Bolet Soc. Brot. x. 149. *O. febrifugum*, Lindl. in Bot. Reg. t. 753. *O. heptodon*, P. Beauv. Fl. Owar. ii. 59. t. 94.

Upper Guinea. Senegambia, cultivated, *Heudelot*. Sierra Leone, *Barter!* *Johnston!* *Scott-Elliot*, 3950! Niger Territory: Benin, *Beauvois*; Cross River, *Holland*, 36! Cameroons: Batanga, *Bates*, 60! Bipinde, *Zenker!* Fernando Po, *Vogel*, 4! *Barter!*

Lower Guinea. Lower Congo: Stanley Pool, *Hens*, 337! Angola; provinces of Pungo Andongo and Golungo Alto, *Welwitsch*, 5564! 5572! 5575! Island of St. Thomas, *Don*, *Moller*.

4. ***O. trichodon***, *Baker ex Gürke in Engl. Pfl. Ost-Afr. C.* 350. A large bush-like perennial, with erect much-branched shortly pubescent stems. Leaves long-stalked, large, oblong or ovate-oblong, crenate, thin, slightly pubescent on both surfaces. Racemes dense, continuous except at the very base; whorls many-flowered; pedicels very short; bracts orbicular-cuspidate, about as long as the flowers. Calyx finally $\frac{1}{6}$ in. long; upper lip orbicular, as long as the campanulate tube; lower teeth very small. Corolla scarcely longer than the calyx. Stamens not exserted; posticous filaments with a hairy tooth above the base.

Mozamb. Dist. British Central Africa: Nyasaland; Blantyre, common, *Buchanan*, 161! Kondowe to Karonga, 2000–6000 ft., *Whyte*, 327! and without precise locality, *Buchanan*, 34! *Cameron*, 4!

5. ***O. suave***, *Willd.*; *Benth. in DC. Prod.* xii. 35. A much-branched erect herbaceous perennial with pubescent stems. Leaves distinctly petioled, ovate, acute, crenate, 3–4 in. long, densely pubescent, especially beneath. Racemes dense, copiously panicled, finally 6–9 in. long; axis densely pubescent, pedicels not very short; bracts ovate, deciduous. Calyx finally $\frac{1}{4}$ in. long; upper lobe orbicular, as long as the hairy campanulate tube; lateral lobes minute; lower small, deltoid, shorter than the upper, finally inflexed. Corolla not much longer than the calyx, whitish or tinged with purple. Stamens shortly exserted, the posticous pair with a tooth at the base.—A. Rich. Tent. Fl. Abyss. ii. 176; Engl. Hochgebirgsfl. Trop. Afr. 357; Vatke in Linnaea, xxxvii. 314. *O. menthaefolium*, Hochst. ex Benth., l.c. ex parte. *O. anosurum*, Fenzl in Flora, 1844, 312. *O. gratissimum*, var. *suave*, Hook. f. Fl. Brit. Ind. iv. 609.

Nile Land. Ethiopia, *Kotschy*, 580! Eritrea: Haichello Rokob, to the north of Acrur, 5200 ft., *Schweinfurth & Riva*, 1108! Keren, *Beccari*, 52! Abyssinia; Tigre; Mount Sholoda, near Adowa, *Schimper*, 109! 1860! Wojerat, *Quartin-Dillon!* and without precise locality, *Schimper*, 259! *Quartin-Dillon & Petit*, 5! British East Africa: Mittu; between Kero and Ngama, *Schweinfurth*, 2800! Taita; Ndara Plain, *Hildebrandt*, 2407!

Lower Guinea. German South-west Africa: Amboland; Olukonda, *Schinz*, 57!

Mozamb. Dist. Zanzibar, *Hildebrandt*, 1000! 1001! German East Africa: Usambara; Masheua, *Holst*, 8738! Portuguese East Africa: Rios de Sena, *Peters*. British Central Africa: Urungu; Fwambo, 5250 ft., *Nutt*! Nyasaland: near Blantyre, *Last*! Mount Chiradzulu, *Whyte*!

Widely spread in Tropical Asia. According to Durand & Schinz (*Études Fl. Congo*, i. 224), and Briquet (*Bull. Soc. Bot. Belg.* xxxvii. 83) *O. gratissimum*, Linn., which differs from *O. suave* by its glabrous stems and leaves, has been collected in Upper, Central, and Lower Congo by Dewèvre and many other botanists. In the Flora of British India, Sir J. D. Hooker treats *suave* as a variety of *gratissimum*. Briquet, in *Bull. Herb. Boiss.* ii. 120, describes two varieties *macrophyllum* and *Mascarenarum*.

6. **O. Stirbeyi**, *Schweinf. & Volk. Liste Pl. Somalis*, 13. A shrub, with shortly pubescent branches. Leaves subsessile, fascicled, verticillate, linear-lanceolate, $\frac{1}{2}$ in. long, acute, narrowed to the base, glabrescent. Racemes lax, simple, terminal; whorls 4-5-flowered; pedicels scarcely longer than the calyx, clothed with reflexed hairs; bracts broadly ovate, acute. Flower-calyx $\frac{1}{10}$ in. long, pubescent; upper tooth semi-orbicular, decurrent; lateral teeth deltoid; lower setaceous. Corolla $\frac{1}{3}$ in. long; tube a little longer than the calyx; lips hairy outside, longer than the tube. Stamens shortly exserted; filaments toothed at the base.

Nile Land. Somaliland: Burka district, *Ghika*.

7. **O. tortuosum**, *Baker*. A much-branched erect low shrub, with spreading woody tortuous branches; young stems very hairy. Leaves small, shortly petioled, oblong, obtuse, crenate, very hairy. Racemes short, moderately dense; rhachis very hairy; whorls many-flowered; pedicels very short; bracts small, deciduous. Calyx finally $\frac{1}{8}$ in. long; upper tooth orbicular, longer than the short campanulate tube; lower cusps small. Corolla scarcely longer than the calyx. Stamens not exserted; posticous filaments with a glabrous tooth above the base.

Mozamb. Dist. German East Africa: Kilimanjaro, 6000-8000 ft., *Johnston*, 187!

8. **O. scoparium**, *Gürke in Engl. Pfl. Ost-Afr. C.* 350. An under-shrub with glabrous erect branches. Leaves sessile, linear, glabrous, $\frac{1}{2}$ -1 in. long. Racemes lax; bracts very acuminate, deciduous. Calyx broadly campanulate; upper tooth suborbicular, not cuspidate, with slightly decurrent edges; lateral teeth truncate, with ciliated margins; lower setaceous. Corolla a little longer than the calyx. Stamens much exserted; upper filaments toothed near the base.

Mozamb. Dist. German East Africa: south of Lake Victoria, at Ukome, *Stuhlmann*, 889, and at Kageyi, *Stuhlmann*, 3489.

9. **O. Fischeri**, *Gürke in Engl. Jahrb.* xix. 195. Stem shrubby, tomentose. Leaves shortly petioled or subsessile, lanceolate, $\frac{1}{2}$ -1 in. or more long, $\frac{1}{8}$ - $\frac{1}{4}$ in. broad, acute or subobtuse, entire, narrowed to the base, pubescent above, tomentose beneath. Racemes long, simple;

pedicels $\frac{1}{10}$ – $\frac{1}{12}$ in. long; bracts twice as long as the calyx. Calyx finally $\frac{1}{5}$ in. long, tomentose, reflexed in fruit and adpressed to the stem; lateral teeth ovate, mucronate; lower very acuminate. Corolla nearly $\frac{1}{2}$ in. long. Stamens nearly twice as long as the lower lip; filaments of the upper pair toothed at the base.

Nile Land. British East Africa: between Taita and Wanga, *Fischer*, 509.

10. **O. glossophyllum**, *Briquet in Engl. Jahrb.* xix. 162. An undershrub, with branchlets pubescent towards the apex. Leaves crowded into whorls at the base of the racemes, petioled, linear-lanceolate, 3–4 in. long, $\frac{1}{3}$ – $\frac{1}{2}$ in. broad, acuminate, entire, coriaceous, green and glabrous on both surfaces. Raceme long, lax; pedicels very pubescent, $\frac{1}{2}$ –1 lin. long; bracts deciduous. Flower-calyx pubescent, $\frac{1}{6}$ – $\frac{1}{5}$ in. long; tube tinged with violet: upper tooth broadly ovate; lateral teeth truncate; lower setaceous. Corolla protruding $\frac{1}{4}$ in. from the throat of the calyx. Stamens much exerted.

Lower Guinea. Angola: Kuango River, *Pogge*, 354.

11. **O. menthæfolium**, *Hochst. ex parte; Benth. in DC. Prod.* xii. 34. Very like *O. canum*, but perennial. Stems erect, much-branched, densely pubescent, 1–2 ft. long. Leaves distinctly petioled, oblong or oblong-lanceolate, pubescent, 1–1 $\frac{1}{2}$ in. long, entire or obscurely crenate. Racemes lax, finally 4–6 in. long; rhachis densely pubescent; bracts deciduous; pedicels very short. Calyx $\frac{1}{8}$ in. long; tube campanulate, very short, densely hairy; upper lobe orbicular; lateral teeth deltoid, minute; lower connate high up, cuspidate, protruding beyond the upper. Corolla twice as long as the calyx; tube short. Stamens much exerted; upper filaments with a tooth near the base.—*A. Rich. Tent. Fl. Abyss.* ii. 175; *Vatke in Linnæa*, xxxvii. 314; *Engl. Hochgebirgsfl. Trop. Afr.* 357.

Nile Land. Nubia: Hor Tamanib, *Lord!* sea-coast, *Bent!* Kordofan: Gebel Kurbag, *Pfund*, 483! Obeid, *Kotschy*, 263! Abyssinia: Tigre; on hills in the Jelajeranne district, *Schimper*, 1599! near Adowa, *Schimper*, 294! Shire, *Quartin-Dillon & Petit!* and without precise locality, *Schimper*, 190! 425! *Quartin-Dillon & Petit!* Somaliland: Adda Galla, *James & Thrupp!*

Also in Arabia.

12. **O. kilimandscharicum**, *Gürke in Engl. Pfl. Ost-Afr. C.* 349. An undershrub with pubescent branchlets. Leaves distinctly petioled, ovate or oblong, 1 $\frac{1}{2}$ –2 in. long, acute, narrowed to the base, deeply serrated, pubescent on both surfaces. Whorls lax, forming a long raceme with a densely pubescent axis; pedicels very short; bracts orbicular-cuspidate, rather large, persistent. Calyx pubescent, finally $\frac{1}{6}$ in. long; tube campanulate; upper tooth orbicular, with decurrent margins; lateral teeth deltoid-cuspidate; lower subulate. Corolla 2–3 times the length of the calyx. Stamens much exerted; upper filaments toothed near the base.

Mozamb. Dist. German East Africa: Kilimanjaro; Marangu, 4900 ft., *Volkens*, 756! between Meru Mountain and Kilimanjaro, *Volkens*, 1637.

13. **O. tomentosum**, *Oliv. in Hook. Ic. Pl. t. 1529*. A dwarf perennial, with a shrubby base and branches coated with dense white stellate pubescence. Leaves shortly petioled, small, broadly ovate, entire, thick, densely pubescent, especially beneath. Racemes short, the lowest whorl subtended by an ordinary leaf; rachis densely tomentose; pedicels short. Calyx $\frac{1}{6}$ in. long; tube campanulate, densely coated with white tomentum; upper lip small, orbicular; 4 lower teeth very small. Corolla not much longer than the calyx; lips short, tomentose outside. Stamens much exserted; filaments of the two upper with a large hairy tooth above the base.

Nile Land. Somaliland: Hahi, *James & Thrupp!*

14. **O. linearifolium**, *Briquet in Engl. Jahrb. xix. 162*. A dwarf perennial, with minutely pubescent stems. Leaves sessile, linear, $\frac{1}{2}$ – $\frac{3}{8}$ in. long, entire, green and pubescent on both surfaces. Whorls 1–2, the flowers crowded so that they appear to form a dense head; pedicels scarcely any; bracts deciduous. Flower-calyx $\frac{1}{6}$ in. long; upper tooth ovate, decurrent; lateral teeth truncate, clothed with white tomentum; lower short, setaceous. Corolla protruding $\frac{1}{3}$ in. from the throat of the calyx. Stamens much exserted.

Lower Guinea. Angola: Kuango River, *Pogge, 357*.

15. **O. poggeanum**, *Briquet in Engl. Jahrb. xix. 163*. Perennial, with slender subglabrous stems; internodes 3–5 in. long. Leaves linear, 1–2 in. long, $\frac{1}{2}$ –1 lin. broad, sub-entire or minutely denticulate, green and glabrous on both surfaces. Racemes 2–3 in. long; lower whorls remote; pedicels very short, densely pubescent; bracts deciduous. Flower-calyx $\frac{1}{4}$ in. long; upper tooth ovate, decurrent; lateral teeth ovate-cuspidate, fimbriated and villous on the margin; lower setaceous. Corolla protruding $\frac{1}{3}$ in. from the throat of the calyx.

Lower Guinea. Angola: Kuango River, *Pogge, 355*.

16. **O. modestum**, *Briquet in Engl. Jahrb. xix. 162*. A perennial, with slender branches, pubescent towards the apex. Leaves linear-lanceolate, $\frac{3}{4}$ –1 in. long, acute, entire, green and pubescent on both surfaces. Whorls (except the lower) congested into a terminal head; pedicels very short; bracts deciduous. Flower-calyx $\frac{1}{8}$ in. long; upper tooth ovate, decurrent; lateral teeth and lower short. Corolla protruding $\frac{1}{3}$ in. beyond the throat of the calyx. Stamens much exserted.

Lower Guinea. Angola: province of Huilla, *Welwitsch, 5518!*

17. **O. Stuhlmanni**, *Gürke in Engl. Jahrb. xix. 196*. Stems herbaceous from a woody base, puberulous or glabrous. Leaves sessile or shortly petioled, linear or linear-lanceolate, 1–2 in. long, $\frac{1}{2}$ – $\frac{1}{4}$ in. broad, acute, entire or remotely serrated, glabrous on both sides. Racemes short, simple; bracts linear-lanceolate; pedicels shorter than the calyx. Calyx $\frac{1}{3}$ – $\frac{1}{4}$ in. long, pilose, reflexed in fruit, adpressed to the stem; upper tooth orbicular-mucronate; lateral teeth broad, truncate;

lower long, setaceous. Corolla red, three times the length of the calyx. Stamens nearly twice as long as the lower lip; upper filaments with a large tooth at the base.

Mozamb. Dist. German East Africa: Unyamwezi; near Gonda, *Böhm*, 19. 32. Usinja; Bugando, *Stuhlmann*, 3519. Usukuma; Usiha, *Stuhlmann*, 4206.

18. **O. fimbriatum**, *Briquet in Engl. Jahrb.* xix. 161. A tall branched perennial, with stems minutely pubescent upwards. Leaves linear-lanceolate, $1\frac{1}{2}$ in. long, $\frac{1}{5}$ in. broad, acuminate, narrowed to the base and decurrent on the petiole, sharply toothed, pubescent on the ribs beneath. Racemes long, lax; pedicels $\frac{1}{8}$ in. long, pubescent; bracts deciduous. Flower-calyx $\frac{1}{4}$ – $\frac{1}{3}$ in. long; upper tooth ovate, slightly decurrent; lateral teeth short, deeply fimbriated; lower long, setaceous, also fimbriated. Corolla protruding above $\frac{1}{2}$ in. from the throat of the calyx. Stamens much exerted.

Lower Guinea. Angola: Malange, *Mechow*, 165.

19. **O. affine**, *Hochst.; Benth. in DC. Prod.* xii. 36. A perennial herb, with erect slender branched subglabrous stems 1– $1\frac{1}{2}$ ft. long. Leaves nearly sessile, distant, oblong-lanceolate, obscurely toothed, nearly glabrous, $1\frac{1}{2}$ –2 in. long, cuneate at the base. Raceme dense at the top, but the lower whorls very remote; rhachis pubescent; pedicels very short; bracts small, deciduous. Calyx finally $\frac{1}{4}$ in. long; upper tooth orbicular, shorter than the tube; lower teeth 2 small cusps. Corolla $\frac{1}{2}$ in. long; tube funnel-shaped, as long as the calyx; lips as long as the tube. Stamens much exerted; upper filaments with a tooth at the base.—*A. Rich. Tent. Fl. Abyss.*, ii. 177; *Vatke in Linnæa*, xxxvii. 315; *Oliv. in Trans. Linn. Soc.* xxix. 134; *Engl. Hochgebirgsfl. Trop. Afr.* 358.

Nile Land. Abyssinia: Sana; in a valley, near Dochli, *Schimper*, 1621! Somaliland: Mount Haquin, near Harar, *Hardegger & Paulitschke*.

Mozamb. Dist. German East Africa: Unyamwezi; Simbah, 4000 ft., *Speke & Grant!* Usambara; Masheua, *Holst*, 8790! British Central Africa: Urungu; Fwambo, *Carson*, 90! 93! 102! Nyasaland; Blantyre, *Scott!* Mount Mlanji, *Whyte!* Mlanji Plateau, *McClounie!* and without precise locality, *Buchanan*, 631! 825!

20. **O. Schweinfurthii**, *Briquet in Engl. Jahrb.* xix. 160. A perennial, with tall robust branched stems pubescent upwards, glabrous in the lower part. Leaves subsessile, oblong, the lower 3–4 in. long, acute, cuneate at the base, crenate above the base, moderately firm, green on both sides, slightly scabrous on the upper surface, pubescent beneath. Racemes short, dense, terminal, the lower flowers abortive; axis densely pubescent; pedicels very short; bracts obovate, cuspidate, large, pubescent. Calyx pubescent, $\frac{1}{6}$ in. long; upper tooth ovate, slightly decurrent; lower teeth setaceous. Corolla 3 times the length of the calyx. Stamens much exerted.

Nile Land. British East Africa: Niamniam; Gumango Hill, *Schweinfurth*, 2890!

21. **O. usaramense**, *Gürke in Engl. Jahrb.* xxvi. 79. Stem simple, erect, pubescent. Leaves subsessile or shortly petioled, oblong-lanceolate, $2\frac{1}{2}$ –3 in. long, under an inch broad, acute or obtuse, narrowed to the base, obscurely toothed, pubescent on both surfaces. Bracts lanceolate, $\frac{1}{2}$ – $\frac{3}{4}$ in. long; pedicels $\frac{1}{12}$ – $\frac{1}{8}$ in. long. Calyx pubescent, finally $\frac{1}{4}$ in. long; upper tooth orbicular, obtuse; lateral teeth obsolete; lower very long, setaceous. Filaments of upper stamens with a tooth at the base.

Mozamb. Dist. German East Africa: Usaramo, *Stuhlmann*, 9292.

22. **O. Descampsii**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 83. An undershrub, with pubescent dull green divaricate branches. Leaves subsessile, oblong, $\frac{1}{2}$ in. long, subacute, narrowed to the base, entire, dull green above with scattered short hairs, subglabrous and gland-dotted beneath. Whorls few, 6-flowered, forming a dense terminal head; bracts oblong-lanceolate, pilose, as long as the calyx. Flower-calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long; tube campanulate, densely clothed with short white hairs; upper tooth ovate, obtuse; lower teeth small, setaceous. Corolla-tube produced $\frac{1}{10}$ in. from the throat of the calyx; upper lip obovate, $\frac{1}{3}$ in. long. Stamens much exerted.

South Central. Congo Free State: M'Towa, on Lake Tanganyika, *Descamps*.

23. **O. filamentosum**, *Forsk.; Benth. in DC. Prod.* xii. 36. A much-branched erect low shrub, with densely pubescent branches. Leaves nearly sessile, oblong-lanceolate, acute, finely serrated, pubescent, $1\frac{1}{2}$ –2 in. long. Racemes few, at first dense, finally lax in the lower half, 4–6 in. long; rhachis pubescent; pedicels not very short; bracts deciduous. Calyx finally $\frac{1}{3}$ in. long; tube campanulate; upper lobe orbicular, as long as the tube; two lower teeth with large cusps, as long as the upper. Corolla white, $\frac{1}{2}$ in. long; tube as long as the calyx; lips shorter than the tube. Stamens twice as long as the corolla; two upper filaments with a villous tooth near the base.—A. Rich. *Tent. Fl. Abyss.* ii. 177; *Vatke in Linnæa*, xxxvii. 314; *Engl. Hochgebirgsfl. Trop. Afr.* 357. *O. grandiflorum*, *L'Hérit. Stirp.* 89, t. 43. *Bechium bicolor*, *Lindl. in Bot. Reg.* 1843, t. 15.

Nile Land. Eritrea: environs of Acrur, 6000 ft., *Schweinfurth & Riva*, '70! Bogos; Atirba, *Steudner*, 1424! Abyssinia: Tigre; at the foot of Mount Sholoda, *Schimper*, 151! near Adowa, *Schimper*, 1849! and without precise locality, *Bruce, Petit! Parkyns! Schimper*, 20A! 20B!

Also in Arabia.

24. **O. gracile**, *Benth. in DC. Prod.* xii. 39. An erect annual, with much-branched pubescent stems $\frac{1}{2}$ –1 ft. long. Leaves small, shortly petioled, oblong, obtuse, crenate, shortly pubescent on both sides. Racemes many, simple; rhachis very slender; whorls usually 2–3-flowered; pedicels not very short; bracts minute. Calyx $\frac{1}{12}$ in. long; upper lip ovate, as long as the campanulate tube; lower with two large cusps. Corolla very small. Stamens not exerted; filaments of the two upper appendiculate with a tuft of hairs.

Mozamb. Dist. Zanzibar, *Bojer!* *Kirk!* *Hildebrandt*, 998! German East Africa: Usambara; Amboni, *Holst*, 2714!

25. **O. Camporum**, *Gürke in Engl. Pfl. Ost-Afr. C.* 350. An undershrub with villous branches. Leaves subsessile, oblong-lanceolate, subobtuse, narrowed to the base, $\frac{3}{4}$ –1 in. long, densely pubescent on both surfaces. Racemes very lax; central cymes shortly peduncled; pedicels very short; bracts small, suborbicular, pubescent, persistent. Flower-calyx $\frac{1}{8}$ in. long; tube campanulate, pubescent; upper tooth orbicular, not cuspidate; lateral teeth oblong, subacute; lower very acuminate. Corolla 2–3 times the length of the calyx. Stamens included; filaments with a tuft of hairs at the base.

Mozamb. Dist. German East Africa: Kilimanjaro; by the River Himo, 3000 ft., *Volkens*, 1739!

26. **O. citriodorum**, *Vis.; Benth. in DC. Prod.* xii. 39. Suffruticose. Stems pubescent. Leaves petioled, ovate-lanceolate, crenate-glabrous. Racemes lax, simple; whorls many-flowered; bracts acute, entire, shortly petioled, ciliate. Calyx villous outside and at the throat; upper lip orbicular; lateral teeth broadly ovate, apiculate; lower lanceolate subulate. Corolla violet-blue, longer than the calyx. Filaments of the upper stamens villous above the base.

Nile Land. Nubia; cultivated in the botanic garden at Padua in 1840.

27. **O. Hanningtonii**, *Baker*. Perennial; stem short, densely hairy. Leaves shortly petioled, ovate, crenate, rugose, coriaceous, under 1 in. long, densely hairy, especially below. Racemes very long and lax; whorls many-flowered; pedicels very short; bracts small, deciduous. Calyx finally $\frac{1}{8}$ in. long; upper lip orbicular, as long as the tube; lower cusps large. Corolla scarcely longer than the calyx. Stamens not exerted; upper filaments with a tuft of hairs at their insertion in the corolla-tube.

Mozamb. Dist. German East Africa: without precise locality, *Hannington!*

28. **O. Rothii**, *Baker*. Shrubby, erect, much branched; stems hairy. Leaves small, petioled, ovate, crenate, very hairy beneath, less so above. Racemes long, lax; rhachis very hairy; flowers few in a whorl; pedicels very hairy, finally $\frac{1}{6}$ in. long; bracts small, deciduous. Calyx finally $\frac{1}{4}$ in. long; upper lip ovate, decurrent, shorter than the tube; lower cusps moderately large. Corolla scarcely longer than the calyx. Stamens not exerted; upper filaments with a tuft of hairs above the base.

Nile Land. Abyssinia: Shoa; Ankober, *Roth*, 500!

29. **O. thymoides**, *Baker*. Perennial, closely resembling *O. menthaefolium* in habit. Stems very slender, slightly hairy. Leaves distinctly petioled, small, ovate, membranous, obscurely toothed, slightly pubescent. Racemes long, very lax; whorls many-flowered; pedicels very short; bracts ovate or lanceolate, foliaceous, about as long as the

flowers. Flower-calyx $\frac{1}{8}$ in. long; upper lip orbicular, as long as the tube; lower cusps small. Corolla twice as long as the calyx. Stamens slightly exserted; upper filaments with a tuft of hairs above the base.

Lower Guinea. Angola: province of Golungo Alto, 1000–2400 ft., *Welwitsch*, 5571!

30. **O. Hildebrandtii**, *Vatke in Linnæa*, xliii. 83. Suffruticose. Stems erect, branched, villous, finally glabrous. Leaves petioled, ovate, crenate, subobtusely, $1\frac{1}{2}$ in. long, rounded or shortly cuneate at the base, membranous, pubescent on both sides. Racemes simple, rather lax; lower whorls $\frac{1}{3}$ – $\frac{1}{2}$ in. apart; bracts small, deciduous; pedicels $\frac{1}{8}$ in. long. Calyx with an ovate obtuse decurrent upper lip and two linear basal teeth. Corolla $\frac{1}{6}$ in. long. Stamens exserted, dilated at the base, subvillous; filaments connate in pairs at the base.

Nile Land. British East Africa: Ukamba; Kitui, *Hildebrandt*, 2741.

31. **O. capitatum**, *Baker*. Perennial. Stem slender, densely hairy. Leaves shortly petioled, small, ovate, acute, deflexed, shallowly dentate, slightly pubescent. Flowers mainly concentrated in a globose terminal cluster; pedicels very short; bracts small. Flower-calyx $\frac{1}{6}$ in. long; upper lip orbicular, as long as the campanulate tube; lower cusps small. Corolla-tube as long as the calyx; lips large. Stamens much exserted; upper filaments with a tuft of hairs above the base.

Nile Land. British East Africa: Lykipia, 6000–8000 ft., *Thomson*!

Mozamb. Dist. German East Africa: Higher plateau, north of Lake Nyasa, *Thomson*!

32. **O. Johnstonii**, *Baker*. Perennial, with the habit of *O. menthaefolium*. Stems erect, densely hairy. Leaves petioled, ovate, membranous, deeply crenate, 1– $1\frac{1}{2}$ in. long, thinly pubescent, especially beneath. Racemes long, lax; rhachis densely hairy; flowers many in a whorl; pedicels very short; bracts orbicular, cuspidate, deciduous. Calyx very hairy, $\frac{1}{8}$ in. long; upper lip orbicular, as long as the campanulate tube; lower cusps small. Calyx twice as long as the corolla. Stamens much exserted; upper filaments with a tuft of hairs above the base.

Nile Land. British East Africa: Lykipia, 6000–8000 ft., *Thomson*! Kapte Plateau, 5000–6000 ft., *Thomson*!

Mozamb. Dist. German East Africa: Kilimanjaro, 6000 ft., *Johnston*!

33. **O. punctatum**, *Baker*. Perennial. Stems short, erect, very hairy. Leaves shortly petioled, oblong, subentire, very hairy, cuneate at the base, $1\frac{1}{2}$ in. long. Racemes short, dense; rhachis hairy; pedicels very short; bracts minute. Flower-calyx hairy, $\frac{1}{4}$ in. long; upper lip about as long as the tube; lower cusps large. Corolla tube as long as the calyx; lips large. Stamens much exserted; upper filaments with a tuft of hairs near the base.

Mozamb. Dist. German East Africa: Lower plateau, north of Lake Nyasa, *Thomson*!

34. **O. kny anum**, *Vatke in Linnæa*, xxxvii. 315. Perennial. Stems erect, branched, pubescent. Leaves nearly sessile, oblong or oblong-lanceolate or linear, crenate, cuneate at the base, 1–2 in. long. Raceme long and lax, with (in the type) a coma of persistent linear bracts; flowers 4–6 in a whorl; pedicels very short, pubescent. Calyx finally $\frac{1}{4}$ – $\frac{1}{3}$ in. long; upper lip orbicular, shorter than the tube; lower cusps large. Corolla twice as long as the calyx; lips as long as the tube. Stamens much exserted; two upper filaments with a tuft of hairs above the base.—*O. calycosum*, Hochst. and *O. comigerum*, Hochst. ex Briquet in Engl. Jahrb. xix. 161.

Nile Land. Abyssinia: Tigre; Hamedo plain near Goelleb, 4000–5500 ft., *Schimper*, 2303! and without precise locality, *Schimper*, 221! 387! Somaliland: Boobi, *James & Thrupp*! British East Africa: Jur; Jur Ghattas, *Schweinfurth*, 1315! Gir, *Schweinfurth*, 1438!

Lower Guinea. German South-west Africa: Amboland; Ukambia, *Schinz*, 50!

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; between Lupata and Tete, *Kirk*! British Central Africa: Nyasaland; Masuka Plateau, 6500–7000 ft., *Whyte*!

Var. *astephanum*, Baker. Raceme without an apical coma of persistent linear bracts.—*O. hians* vars. *macrocaulon* and *microphyllum*, Briquet in Engl. Jahrb. xix. 161.

Upper Guinea. Niger Territory: Nupe, at Lôm, *Barter*, 1283!

Lower Guinea. Angola, *Welwitsch*, 5493! 5514!

Mozamb. Dist. German East Africa: Lake Tanganyika, *Cameron*! Lower plateau, north of Lake Nyasa, *Thomson*!

35. **O. lamiifolium**, *Hochst.*; *Benth. in DC. Prod.* xii. 37. An erect perennial, with very hairy stems. Leaves distinctly petioled, ovate, acute, regularly crenate, 1–2 in. long, slightly pubescent on both sides. Racemes long, lax, branched at the base; whorls many-flowered: bracts broadly ovate, cuspidate, deciduous, bright-coloured; pedicels $\frac{1}{6}$ in. long. Calyx at first $\frac{1}{4}$ in., finally $\frac{1}{3}$ – $\frac{1}{2}$ in. long; upper tooth ovate, obtuse, rather shorter than the tube; lower with two large cusps. Corolla-tube as long as the calyx. Stamens much exserted; filaments of the two upper penicillate above the base.—A. Rich. Tent. Fl. Abyss. ii. 178; Engl. Hochgebirgsfl. Trop. Afr. 358; *Vatke in Linnæa*, xxxvii. 315.

Nile Land. Abyssinia: Tigre; among shrubs on the high banks of rivers in the northern region of Mount Sholoda, *Schimper*, 107! near Adowa, *Schimper*, 1864! and without precise locality, *Schimper*, 258!

36. **O. dichotomum**, *Hochst.*; *Benth. in DC. Prod.* xii. 39. An erect annual, with the habit of *O. basilicum*. Stems much-branched, erect, slightly pubescent. Leaves shortly-petioled, oblong-lanceolate, subentire, 1–1½ in. long, nearly glabrous. Racemes long, lax; rachis slightly pubescent; whorls many-flowered; bracts small; pedicels very short. Fruit-calyx $\frac{1}{6}$ in. long; upper lip ovate-cuspidate, longer than

the campanulate tube; lower cusps large. Corolla a little longer than the calyx. Stamens short; upper filaments not appendiculate.

Nile Land. Kordofan: Arashkol Mountain, in dried up stagnant pools, *Kotschy*, 73! and without precise locality, *Kotschy*, 122!

37. **O. tereticaule**, *Poir.*; *Benth. in DC. Prod.* xii. 41. An erect much-branched annual, with pubescent stems $\frac{1}{2}$ –1 ft. long. Leaves shortly-petioled, oblong or oblong-lanceolate, cuneate at the base, entire or serrate, 1–1 $\frac{1}{2}$ in. long, pubescent on both sides. Racemes lax; rhachis pubescent; flowers about 4 in a whorl; bracts often as large as the stem-leaves; pedicels hairy, not very short. Calyx finally $\frac{1}{4}$ in. long; upper tooth much shorter than the oblong-cylindrical tube; 4 lower teeth shorter. Corolla scarcely longer than the calyx. Stamens short; upper filaments not appendiculate.—*O. Thonningii*, *Schumach.* in *Schumach. & Thonn. Beskr. Guin. Pl.* 265. *O. darfurense*, *Schweinf. MS.* in *Pfund. Pl. Kordof. Exsicc.*, No. 472. *O. corchorifolium*, *Hochst. MS.* in *Schimp. Exsicc.* 2214. *Orthosiphon cleistocalyx*, *Vatke* in *Linnaea*, xxxvii. 317.

Upper Guinea. Senegambia, *Leprieur!* *Heudelot*, 168! Guinea, *Thonning.*

Nile Land. Darfur: Gebel Surin, *Pfund*, 472! Abyssinia: mountains near Mawerr, 3000–5000 ft., *Schimper*, 2214! Somaliland: Boobi, *James & Thrupp!*

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; between Lupata and Tete, *Kirk!*

38. **O. verticillifolium**, *Baker in Kew Bulletin*, 1895, 224. An undershrub 2 ft. high, with pubescent branchlets. Leaves mostly fasciated, sessile, linear, entire, rigid, green and finely pubescent on both surfaces, the largest $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Racemes lax; whorls 5–6-flowered; pedicels very short; bracts minute. Calyx pubescent, finally $\frac{1}{4}$ in. long; tube campanulate; upper tooth orbicular, decurrent, the others minute. Corolla $\frac{1}{3}$ in. long; tube as long as the calyx; lips shorter than the tube. Stamens much exserted, $\frac{3}{4}$ –1 in. long.

Nile Land. Somaliland: Golis range at Guldo Hammed, *Miss Edith Cole!* *Mrs. Lort-Phillips!*

39. **O. rigidum**, *Benth. in DC. Prod.* xii. 40. A low undershrub, with erect pubescent branches. Leaves sessile, lanceolate, acute, amplexicaul, rounded at the base, entire, rigid, ciliate. Racemes lax, 3–4 in. long; whorls reduced to 2 flowers: rhachis and pedicels glandular-pubescent. Calyx ovate, glandular-pubescent; upper lip shortly decurrent; lateral ovate, as long as the upper; lower cusps longer. Corolla scarcely longer than the calyx; upper filaments naked.

Lower Guinea. Angola; in the Muséum d' Histoire Naturelle, Paris.

40. **O. staminosum**, *Baker in Kew Bulletin*, 1895, 224. An undershrub; branches clothed with short spreading white hairs. Leaves petioled, ovate-oblong, 1 $\frac{1}{2}$ –2 in. long, subentire or obscurely crenate, pubescent on both surfaces. Racemes long, lax; whorls few-flowered; pedicels very short, deflexed; bracts small, oblong, foliaceous, persistent.

Calyx pilose, finally $\frac{1}{6}$ in. long; upper tooth orbicular, decurrent; the others cuspidate. Corolla $\frac{1}{3}$ in. long; tube as long as the calyx; upper lip oblong; lower rather longer. Stamens exerted; filaments glabrous, not appendiculate at the base. Style longer than the stamens.

Nile Land. Somaliland: Golis range, at Shaile (? Sheikh) Pass, 3000–4000 ft., *Miss Edith Cole!*

41. **O. Buchananii**, *Baker*. A tall perennial herb, with the habit of *O. gratissimum*. Stems erect, glabrous. Leaves nearly sessile, oblong or ovate-oblong, crenate, cuneate at the base, 2–3 in. long, subglabrous. Racemes moderately dense, 3–6 in. long; whorls many-flowered; rhachis hairy; bracts small, deciduous; pedicels $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Fruit-calyx $\frac{1}{4}$ in. long; upper lip orbicular, as long as the tube; basal cusps very large. Corolla not much longer than the calyx. Stamens short, all inserted high up in the corolla-tube; upper filaments not appendiculate.

Mozamb. Dist. British Central Africa: Nyasaland; Shire Highlands, common, *Buchanan*, 81! Mount Zomba, 4000–6000 ft., *Whyte!* Plains of Zomba, 2500–3000 ft., *Whyte!* Blantyre, in waste places, *Scott!*

42. **O. laxiflorum**, *Baker*. Perennial. Stems long, slender, erect, slightly hairy. Leaves distinctly petioled, membranous, ovate, crenate, 1–1 $\frac{1}{2}$ in. long, slightly hairy beneath. Racemes very long and lax; flowers about 4 in a whorl; pedicels finally $\frac{1}{6}$ in. long; bracts small, foliaceous. Calyx finally $\frac{1}{6}$ in. long; upper lip ovate, shorter than the tube; lower cusps longer. Corolla a little longer than the calyx; upper filaments naked.

Lower Guinea. Angola: province of Pungo Andongo and Golungo Alto, *Welwitsch*, 5552! 5554!

43. **O? membranaceum**, *Benth. in DC. Prod.* xii. 41. Stem erect, villous, apparently herbaceous. Leaves shortly-petioled, ovate, obtuse, rounded at the base, crenate, rugose, villous. Raceme 4–6 in. long; whorls about 10-flowered; lower bracts like the stem-leaves; upper smaller. Calyx oblong, pubescent; upper lip orbicular, scarcely decurrent; lower cusps linear, subulate. Corolla scarcely longer than the calyx; upper filaments naked.

Lower Guinea. Angola; in the Muséum d'Histoire Naturelle, Paris.

Imperfectly known species.

44. **O. Menyhartii**, *Gürke in Bull. Herb. Boiss.* vi. 556. A dwarf undershrub, with pubescent stems. Leaves sessile, linear, 1 $\frac{1}{2}$ in. long, $\frac{1}{2}$ –1 lin. broad, entire or sometimes toothed, pubescent on both surfaces. Whorls remote, usually 2-flowered; bracts small, lanceolate; pedicels $\frac{1}{12}$ – $\frac{1}{8}$ in. long. Calyx between tubular and campanulate; upper tooth broadly ovate, subacute; lateral teeth short, deltoid-cuspidate; lower subulate, curved, rigid, longer than the upper.

Mozamb. Dist. British Central Africa: Northern Zambesia; Boruma, *Menyhart*, 810.

2. **ERYTHROCHLAMYS**, Gürke in Engl. Jahrb. xix. 222.

Calyx very accrescent; tube campanulate; upper lip broad, with decurrent margins, finally very large and wrapped round the other teeth, which are deltoid-acuminate. Corolla-tube slightly exserted from the calyx, nearly straight; limb bilabiate; upper lip 4-lobed; lower ovate, entire, shorter than the upper. Stamens 4, didynamous; filaments free, toothless, very long, much exserted; anthers 1-celled. Disk subequal. Style apparently subentire. Nucules crustaceous, smooth, included in the persistent calyx.

Endemic and monotypic.

1. **E. spectabilis**, Gürke in Engl. Jahrb. xix. 223. A branched undershrub, pubescent upwards. Leaves oblong-lanceolate, sessile, 3-4 in. long, about 1 in. broad, crenate, obtuse, narrowed to the base, scabrous above, pubescent beneath. Racemes simple, terminal; whorls simple, 6-flowered; pedicels $\frac{1}{4}$ in. long; bracts orbicular, acute, pubescent, $\frac{1}{8}$ - $\frac{1}{6}$ in. long. Calyx clothed like the pedicels with long branched hairs; tube $\frac{1}{5}$ in. long; upper tooth ovate, mucronate, subcordate at the base, $\frac{1}{4}$ in. long in the flowering stage, finally $\frac{3}{4}$ in. long, red and wrapped round the others. Corolla pubescent. Posticous filaments bearded at the base.—Engl. Pfl. Ost-Afr. C. 348, t. 43, fig. A-J.

Nile Land. Somaliland; in swamps near the Dagatto Torrent, Ghika. British East Africa: Plateau between Ulu and Ukamba, Fischer, 500.

3. **PLATYSTOMA**, P. Beauv.; Benth. et Hook. f. Gen. Plant. ii. 1172.

Calyx deflexed in fruit; tube campanulate; limb deeply bilabiate, with two subequal oblong lips, the upper not decurrent, with a small tooth on each. Corolla-tube short, funnel-shaped; limb bilabiate; upper lip 4-toothed, lower scarcely longer, slightly concave, entire. Stamens 4, declinate; filaments free, dilated at the base; anthers 1-celled. Disk glandular. Style shortly bifid at the apex. Nucules ovoid, minutely reticulated.—Habit of *Ocimum*.

One species also in Tropical Asia.

Corolla not much longer than the calyx 1. *P. africanum*.
Corolla much longer than the calyx 2. *P. buettnerianum*.

1. **P. africanum**, P. Beauv.; Benth. in DC. Prod. xii. 47. An erect annual, with a much-branched slender slightly pubescent stem, 1-2 ft. long. Leaves petioled, ovate, crenate, membranous, slightly pubescent, 1-2 in. long. Racemes moderately dense, 3-6 in. long; flowers about 10 in a whorl; bracts as long as the whorls; pedicels short. Calyx $\frac{1}{2}$ in. long. Corolla pale lilac, not much longer than the calyx; lips short. Stamens not exserted.—P. Beauv. Fl. Owar. t. 95, fig. 2; Henriques in Bolet. Soc. Brot. x. 149; Briquet in Bull. Soc. Bot. Belg. xxxvii. 75. *P. flaccidum*, Benth.; Hook. f. Fl. Brit. Ind. iv. 611. *Ocimum flaccidum*, A. Rich. Tent. Fl. Abyss. ii. 179.

Upper Guinea. Sierra Leone, *Morson!* Liberia: Cape Palmas, *Ansell!* Gold Coast, *Burton!* Aquapim Mountains, *Thonning!* Lagos: Abeokuta, *Irving,* 83! Niger Territory: Benin, *Beauvois!* Nupe; Jeba, *Barter!* Lower Niger, Onitsa, *Barter,* 99! Stirling Hill, *Ansell!* Niger Delta; Nun River, *Vogel,* 10! Cameroons: Batanga, *Bates,* 15! Bipinde, *Zenker,* 1218! Fernando Po, *Vogel,* 213! *Barter!*

Nile Land. Abyssinia, *Petit!* British East Africa: Jur; Gir, *Schweinfurth,* 2552!

Lower Guinea. Island of St. Thomas, *Moller & Quintas.* Lower Congo: Lutete, *Hens,* 302! and without precise locality, *Cabra,* 106. Angola: Bembe, *Monteiro!* Golungo Alto, *Welwitsch,* 5534! 5535! 5536! 5581!

Mozamb. Dist. German East Africa: Usambara; Lutindi, *Holst,* 3255! Gonja, *Holst,* 4226! Kilimanjaro, 5000–6000 ft., *Volkens,* 580! *Johnston!* British Central Africa: Nyasaland; between the River Songwe and Karonga, 1700–2000 ft., *Whyte,* 71!

Also in India.

2. ***P. buettnerianum***, *Briquet in Engl. Jahrb.* xix. 166. A much-branched herb, with square thinly pubescent branches. Leaves shortly petioled, ovate-rhomboid, 1 in. long, acute, crenate above the entire cuneate base, membranous, green and glabrous on both surfaces. Cymes sessile, forming a lax simple terminal raceme 2–3 in. long; pedicels short; lower bracts ovate, foliaceous. Calyx $\frac{1}{2}$ in. long; lips ovate, the upper rather longer, recurved. Corolla protruding $\frac{1}{4}$ in. from the throat of the calyx. Stamens not exerted.

Lower Guinea. Lower Congo: Leopoldville, at Stanley Pool, *Büttner,* 449!

4. **GENIOSPORUM**, Wall.; Benth. et Hook. f. *Gen. Plant.* ii. 1172.

Calyx suberect or declinate in fruit; tube often transversely rugose; teeth subequal or the upper one broader, not decurrent. Corolla-tube scarcely longer than the calyx; lips subequal; lower entire, not concave. Stamens 4, didynamous, declinate; filaments not appendiculate; anthers 1-celled. Disk glandular. Style shortly bifid. Nucules ovoid, smooth or minutely punctate.—Erect or procumbent, glabrous or pubescent, herbs. Whorls many-flowered, forming dense terminal racemes: lower bracts often large and whitish or coloured. Flowers very small.

Species 10–12. Also in Madagascar and Tropical Asia.

Leaves oblong.

- | | |
|--------------------------------------|-----------------------------|
| Leaves sessile | 1. <i>G. paniculatum.</i> |
| Leaves shortly petioled | 2. <i>G. rotundifolium.</i> |
| Leaves distinctly petioled | 3. <i>G. discolor.</i> |
| Leaves obovate-cuneate | 4. <i>G. lasiostachyum.</i> |

Leaves ovate.

Pubescence grey.

Leaves obscurely pubescent beneath 5. *G. angolense.*

Leaves densely pubescent beneath 6. *G. paludosum.*

Pubescence violet or ferruginous 7. *G. scabridum.*

Pubescence reddish 8. *G. affine.*

1. **G. paniculatum**, *Baker*. A tall erect perennial, with stems glabrous in the lower part, obscurely pubescent upwards. Leaves small, sessile, oblong, deflexed, deeply crenate, obscurely pubescent. Racemes many, short, oblong, sessile, paniced; pedicels short; bracts all small, ovate. Fruit-calyx hairy, $\frac{1}{8}$ in. long; tube campanulate; upper tooth ovate, the others lanceolate. Corolla twice as long as the calyx.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5527! 5528! 5529!

2. **G. rotundifolium**, *Briquet in Engl. Jahrb.* xix. 163. A robust erect herb 3–4 ft. high; branches rigid, clothed with spreading hairs. Leaves shortly petioled, subcoriaceous, oblong, 1–1½ in. long, obtuse, subcordate at the base, crenate, green and pubescent above, grey and more densely pubescent beneath. Racemes long, dense; pedicels as long as the calyx; bracts ovate, white, the lower longest. Calyx violet; tube campanulate, pubescent, $\frac{1}{2}$ lin. long; teeth deltoid-cuspidate, half as long as the tube, the upper largest. Corolla rose-red, protruding $\frac{1}{8}$ in. from the throat of the calyx. Stamens exerted; upper filaments villous at the base.

Lower Guinea. Angola: Malange, *Mechow*, 451, in swamps, at Cula Muchito, *Buchner*, 43.

3. **G. discolor**, *Baker*. A perennial herb; stems densely clothed with short spreading white hairs. Leaves distinctly petioled, oblong, 1½–2 in. long, crenate, green and pubescent above, densely clothed with soft whitish woolly hairs beneath. Racemes dense, cylindrical, 1–2 in. long, forming a small terminal panicle; pedicels as long as the calyx; bracts deciduous. Calyx campanulate, $\frac{3}{4}$ lin. long, densely clothed with soft violet hairs; teeth small, deltoid. Corolla twice as long as the calyx. Stamens exerted.

Nile Land. British East Africa: between Machakos and Kikuyu, 5000–6000 ft., *Scott-Elliot*, 6597!

4. **G. lasiostachyum**, *Briquet in Engl. Jahrb.* xix. 164. An erect herb, with downy branches. Leaves small, obovate, obtuse, narrowed to the base, dull green, pubescent. Racemes long, dense, slender; pedicels $\frac{1}{2}$ lin. long; bracts ovate-cuspidate, $\frac{1}{6}$ – $\frac{1}{5}$ in. long. Calyx campanulate, woolly, $\frac{1}{2}$ lin. long; teeth minute. Corolla protruding $\frac{1}{12}$ in. from the throat of the calyx. Stamens shortly exerted upper filaments villous at the base.

Lower Guinea. Angola, *Welwitsch*, 5489.

Welwitsch's 5489 is represented at Kew by a *Plectranthus*.

5. **G. angolense**, *Briquet in Engl. Jahrb.* xix. 164. A tall erect perennial, with finely pubescent stems. Leaves petioled, ovate, crenate, finely grey-pubescent, 1–2 in. long. Whorls forming dense oblong-cylindrical terminal racemes, 1–2 in. long; bracts all shorter than the flowers; pedicels very short, hairy. Fruit-calyx $\frac{1}{12}$ in. long; tube campanulate; teeth deltoid. Corolla twice as long as the calyx; lips short. Stamens shortly exerted.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5491 5498!

6. **G. paludosum**, *Baker*. An erect perennial, with branched slender pubescent stems, 1–2 ft. long. Leaves shortly petioled, ovate, crenate, 1–2 in. long, thinly pubescent on both sides. Whorls forming dense cylindrical terminal racemes, 1–3 in. long; lower bracts, as in *G. madagascariense*, large, ovate, white; upper small, pubescent; pedicels short. Fruit-calyx pubescent, $\frac{1}{8}$ in. long; tube oblong; teeth all deltoid. Corolla twice as long as the calyx; lips short. Stamens shortly exserted.

Nile Land. British East Africa: Uganda, common in grassland, *Wilson*, 67!

Mozamb. Dist. Portuguese East Africa: Unangu to Lake Shirwa, *Johnson*, 69! Zambesiland, *Kirk*! British Central Africa: Nyasaland; Blantyre, *Buchanan*, 129! Mount Zomba, 4000–6000 ft., *Whyte*! Masuka Plateau, *Whyte*! and without precise locality, *Buchanan*, 719!

7. **G. scabridum**, *Briquet in Engl. Jahrb.* xix. 165. An erect herb, with ascending branches, clothed with violet or ferruginous hairs. Leaves small, shortly petioled, round-ovate, obtuse, rounded at the base, crenate, clothed both above and below with short rigid hairs, bullate on the under surface. Racemes dense; pedicels $\frac{1}{2}$ lin. long; bracts suborbicular, white at the base, green or purplish on the margin. Calyx pubescent, violet; tube campanulate, $\frac{1}{2}$ lin. long; teeth shorter than the tube; upper ovate; 4 lower very small, deltoid. Corolla protruding 1 lin. from the throat of the calyx. Stamens exserted; upper filaments villous at the base.

South Central. Congo Free State: Lunda; Lulua River, *Pogge*, 347.

8. **G. affine**, *Gürke in Engl. Jahrb.* xix. 197. Stems suffruticose, branched, clothed with reddish hairs. Leaves shortly petioled, broadly ovate, acute or subobtuse, $1\frac{1}{2}$ in. long, 1 in. broad, cordate or rounded at the base, crenate, pubescent above, subvillous beneath. Racemes simple, dense; bracts sessile, pubescent, the lower orbicular, the upper ovate; whorls many-flowered; pedicels as long as the calyx. Flowers $\frac{1}{10}$ – $\frac{1}{12}$ in. long. Calyx campanulate, not pubescent. Corolla-tube rather longer than the calyx. Stamens exserted.

Nile Land. British East Africa: Uganda, *Stuhlmann*, 1351, Lendu Plateau, 4500 ft., *Stuhlmann*, 2753.

5. **MOSCHOSMA**, *Reichb.; Benth. et Hook. f. Gen. Plant.* ii. 1173.

Flowers hermaphrodite or subunisexual. Fruit only slightly declinate, but little accrescent; tube campanulate; teeth less unequal than in *Ocimum*, the upper not decurrent. Corolla-tube short; limb bilabiate; lobes short, the lower nearly flat. Stamens 4, didynamous, declinate; filaments filiform; anthers 1-celled. Disk glandular. Style bifid. Nucules ovoid, smooth, rather compressed.—Annual or perennial herbs. Leaves petioled, crenate. Whorls many-flowered, forming paniced racemes. Flowers very small.—*Basilicum*, *Moench, Meth. Suppl.* 143.

Species 6, spread through the tropical regions of the Old World.

- | | |
|---|----------------------------|
| Annual. Calyx-teeth unequal | 1. <i>M. polystachyum.</i> |
| Perennial. Calyx-teeth subequal. | |
| Racemes very slender | 2. <i>M. urticifolium.</i> |
| Racemes not very slender. | |
| Pedicels always very short | 3. <i>M. multiflorum.</i> |
| Pedicels of staminate flowers often as long as the
calyx | 4. <i>M. riparium.</i> |

1. **M. polystachyum**, *Benth.*; *DC. Prod.* xii. 48. Annual. Stems much branched, slender, tetragonous, obscurely pubescent, 1-2 ft. long. Leaves petioled, ovate, acute, crenate, membranous, slightly pubescent. Whorls 6-10-flowered, forming copious lax racemes 2-4 in. long; pedicels short; bracts minute. Calyx $\frac{1}{12}$ - $\frac{1}{8}$ in. long; tube campanulate; upper tooth orbicular, obtuse; lateral teeth ovate; lower teeth cuspidate. Corolla pale lilac.—*Benth.* in *Hook. Niger Fl.* 488; *Oliv.* in *Trans. Linn. Soc.* xxix. 136; *Durand & De Wild.* in *Bull. Soc. Bot. Belg.* xxxvii. 82; *Britten* in *Gregory, Great Rift Valley*, 396; *Hook. f. Fl. Brit. Ind.* iv. 612. *M. dimidiatum*, *Benth.* in *DC. Prod.* xii. 48. *Basilicum polystachion*, *Moench, Meth. Suppl.* 143; *Briquet* in *Bull. Herb. Boiss.* ii. 123.

Upper Guinea. Guinea, *Thonning*. Cape Coast Castle, *Vogel!* Lagos: near Lagos, *Rowland!* Niger Territory; Nupe, *Barter*, 1167!

Nile Land. Sennar, *Kotschy*, 140! 219! Kordofan: in dried mud on Arashkol Mountain, *Kotschy*, 164! British East Africa: White Nile; *Petherick!* *Speke & Grant!* *Schweinfurth*, 989! *Sabatier*. Ribe; near Mombasa, *Wakefield!* Kau and Lake Dumi in the Tana Valley, *Gregory*.

Lower Guinea. Congo, *Smith!* Lower Congo; Sicia, *Dupuis*, 43, *Dewèvre*, 184. Angola, *Welwitsch*, 5547! 5582!

South Central. Congo Free State: Monbuttu; by the Kibali River, *Schweinfurth*, 3543! Upper Congo: Massange, *De Beerst*, 84. Uvira, *De Beerst*, 45. Mtowa, *Descamps*.

Mozamb. Dist. Zanzibar, *Bojer!* German East Africa: Zanguabar, *Kirk*, 97! British Central Africa: Nyasaland; Elephant Marsh, by the River Shire, *Kirk!* Kondowe to Karonga, 2000-6000 ft., *Whyte!* Mount Chiradzuiu, 4000 ft., *Whyte!*

Also in the Mascarene Islands, and through Tropical Asia and North Australia. *Briquet* in *Engl. & Prantl., Nat. Pflanzenfam.* iv. 3A, 368, gives names to several varieties of this polymorphous species.

2. **M. urticifolium**, *Baker*. Perennial. Stem slightly pubescent. Leaves long-petioled, ovate, membranous, deeply and irregularly crenate, 3-4 in. long, slightly pubescent on both sides. Flowers many in a whorl, forming a lax panicle 1 ft. or more long, with compound branchlets; bracts minute; rhachides densely clothed with white tomentum. Calyx densely tomentose, $\frac{1}{2}$ lin. long; tube campanulate; teeth subequal, ovate, finally as long as the tube. Corolla twice as long as the calyx.

Mozamb. Dist. German East Africa: Mount Kilimanjaro, 6000 ft., *Johnston!*

3. **M. multiflorum**, *Benth. in DC. Prod.* xii. 49. Perennial, suffruticose. Stems densely pubescent. Leaves petioled, cordate-ovate, membranous, deeply crenate, 3–6 in. long, pubescent on both sides. Flowers subunisexual, forming a lax panicle often 1 ft. long, about 12 in a whorl; staminate whorls less dense than the pistillate; bracts minute; rhachis densely hairy. Calyx hairy, $\frac{1}{2}$ lin. long; teeth small, subequal, ovate. Corolla twice as long as the calyx.—A. Rich. Tent. Fl. Abyss. ii. 179; Gürke in Engl. Pfl. Ost-Afr. C. 349. *Plectranthus multiflorus*, Hochst. ex Benth. l. c.

Nile Land. Abyssinia: between Sana and Ferrefera, *Schimper*, 776; near Jelejeranne, *Schimper*, 1688! Shire, *Quartin-Dillon & Petit*, 9! and without precise locality, *Schimper*, 686! *Parkyns*!

Mozamb. Dist. German East Africa: Usambara; Masheua, *Holst*, 8720!

4. **M. riparium**, *Hochst.*; *Benth. in DC. Prod.* xii. 49. Shrubby, reaching a height of 10–12 ft. Stems densely hairy. Leaves petioled, cordate-ovate, deeply crenate, membranous, 3–6 in. long, more or less hairy on both sides. Flowers subunisexual, many in a whorl, forming dense panicles 1 ft. or more long; rhachides hairy; pistillate flowers forming much more dense spikes than the staminate. Calyx $\frac{1}{2}$ lin. long; teeth small, ovate. Corolla $\frac{1}{8}$ in. long in the staminate flowers, smaller in the pistillate.—*M. myriostachyum*, *Benth. in Gen. Plant.* ii. 1173.

Nile Land. British East Africa: among dry volcanic rocks in an empty valley near Lake Nakuro, 6000 ft., *Scott-Elliot*, 6801! Ruwenzori, 6000–7000 ft., *Scott-Elliot*, 7879!

Lower Guinea. Angola, *Welwitsch*, 5477!

Mozamb. Dist. German East Africa: Lower Plateau, north of Lake Nyasa, *Thomson*! Portuguese East Africa: Morambala Mountain, *Waller*! British Central Africa: Nyasaland; near the Murchison Falls, *Meller*! near Blantyre, *Buchanan*, 159! *Last*! banks of a stream between Blantyre and Matope, *Scott*! Mount Chiradzulu, 4000 ft., *Whyte*! *Meller*! Masuka Plateau, 6500–7000 ft., *Whyte*, 300! Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte*!

Also Natal. Doubtfully distinct from *M. multiflorum*.

6. ACROCEPHALUS, *Benth.*; *Benth. et Hook. f. Gen. Plant.* ii. 1173.

Calyx-tube long, compressed, gibbous at the base; limb bilabiate; upper lip entire or denticulate; lower entire, emarginate or 4-toothed. Corolla small; tube short; limb bilabiate; upper lip shortly 4-lobed; lower scarcely longer, entire, nearly flat. Stamens 4, didynamous, declinate, scarcely exerted; filaments free, filiform, not appendiculate; anthers 1-celled. Disk a small anticous gland. Style shortly bifid at the stigmatose tip. Nucules ovoid or oblong, smooth.—Perennial or annual herbs. Leaves opposite or congested into whorls, sessile or petioled, usually linear or lanceolate. Whorls of flowers congested into dense globose heads, which are bracteate at the base, often by coloured

leaves; special flower-bracts membranous or rigid, obovate-cuneate usually shorter than the flowers.

A few additional species in Tropical Asia, Madagascar, and Natal.

- | | |
|--|-------------------------------|
| Head solitary, terminal | 1. <i>A. monocephalus.</i> |
| Heads 1-3 at the end of the leafy branches. | |
| Leaves linear | 2. <i>A. centratheroides.</i> |
| Leaves oblong | 3. <i>A. galeopsifolius.</i> |
| Heads few, laxly corymbose. | |
| Leaves linear | 4. <i>A. gracilis.</i> |
| Leaves lanceolate | 5. <i>A. succisæfolius.</i> |
| Leaves oblong. | |
| Peduncles short | 6. <i>A. cylindræus.</i> |
| Peduncles long | 7. <i>A. oligocephalus.</i> |
| Heads many, densely corymbose. | |
| Basal bracts blue-purple. | |
| Basal bracts ovate | 8. <i>A. porphyrophyllus.</i> |
| Basal bracts ovate-lanceolate. | |
| Bracts blue-purple at the tip | 9. <i>A. Schweinfurthii.</i> |
| Bracts blue-purple at the base | 10. <i>A. iododermis.</i> |
| Basal bracts pale towards the base. | |
| Leaves linear or lanceolate. | |
| Heads cylindrical | 11. <i>A. Campicola.</i> |
| Heads globose. | |
| Pubescence of peduncle dark blue | 12. <i>A. poggeanus.</i> |
| Pubescence of peduncle grey. | |
| Leaves ascending. | |
| Hairs of peduncle long spreading | 13. <i>A. polytrichus.</i> |
| Hairs of peduncle very short. | |
| Leaves thick and strongly veined | 14. <i>A. venosus.</i> |
| Leaves thinner and not strongly veined | 15. <i>A. cæruleus.</i> |
| Leaves deflexed. | |
| Leaves linear, small | 16. <i>A. lilacinus.</i> |
| Leaves linear, long | 17. <i>A. lagoensis.</i> |
| Leaves lanceolate | 18. <i>A. Buettneri.</i> |
| Leaves oblong or oblong-lanceolate. | |
| Leaves not at all coriaceous | 19. <i>A. callianthus.</i> |
| Leaves subcoriaceous. | |
| Leaves very rugose beneath | 20. <i>A. præaltus.</i> |
| Leaves not rugose beneath | 21. <i>A. lippoides.</i> |
| Basal bracts green and foliaceous to the base. | |
| Leaves linear | 22. <i>A. Heudelotii.</i> |
| Leaves linear-lanceolate | 23. <i>A. Laurentii.</i> |
| Leaves lanceolate. | |
| Leaves glabrous in the upper surface. | |
| Veins of under surface of the leaves prominent | 24. <i>A. reticulatus.</i> |
| Veins of under surface of leaf not raised | 25. <i>A. dissitifolius.</i> |
| Leaves scabrid on the upper surface | 26. <i>A. mechowianus.</i> |
| Leaves hairy on the upper surface. | |
| Basal bracts few, inconspicuous. | |
| Hairs of stem sparse, spreading | 27. <i>A. Welwitschii.</i> |
| Hairs of stem dense, adpressed | 28. <i>A. sericeus.</i> |
| Basal bracts several, sharply reflexed. | |
| Leaves pubescent | 29. <i>A. hyploides.</i> |
| Leaves villous | 30. <i>A. masuianus.</i> |

Leaves oblong-lanceolate.	
Leaves sessile or subsessile.	
Leaves entire . . . . .	. 31. <i>A. Hensii</i> .
Leaves distinctly toothed . . . . .	. 32. <i>A. minor</i> .
Leaves shortly petioled.	
Stem slightly pilose . . . . .	. 33. <i>A. elongatus</i> .
Stem densely clothed with spreading hairs . . . . .	. 34. <i>A. angolensis</i> .
Leaves oblong . . . . .	. 35. <i>A. divaricatus</i> .
Heads in paniced clusters . . . . .	. 36. <i>A. paniculatus</i> .

1. **A. monocephalus**, *Baker*. Perennial. Stem slender, flexuose, slightly pubescent, 6–8 in. long. Leaves linear, sessile, denticulate, spreading, 1–1½ in. long, slightly pubescent on both sides. Head single, terminal, globose, 1½ in. diam.; basal bracts small, ovate, greenish-white, with leafy cusps; flower-bracts rhomboid, very hairy, ⅙ in. long and broad, subacute, green with a pale base. Calyx villous, ⅙ in. long; lips oblong. Corolla twice as long as the calyx; lips short.

Mozamb. Dist. German East Africa: Lower Plateau, north of Lake Nyasa, *Thomson!*

2. **A. centratheroides**, *Baker*. Annual. Stem short, pubescent, with several long spreading branches. Leaves opposite, lanceolate, sessile, dentate, pubescent, 2–3 in. long. Heads sessile at the end of the main stem and branches, overtopped by the upper branchlets, globose, ⅓–½ in. diam.; basal bracts ovate or lanceolate, very hairy, green; flower-bracts hairy, green, obovate-cuneate, ⅙ in. long. Calyx as long as the bract. Corolla ¼ in. long; tube slender; limb short.

Upper Guinea. Lower Niger, *Baikie!*

3. **A. galeopsifolius**, *Baker*. Annual. Stems 1½–2 ft. long, slender, much branched, with a few short spreading hairs. Leaves petioled, oblong, acute, crenate, 1½–2 in. long, slightly hairy, cuneate at the base. Heads globose, ¼–⅓ in. diam., solitary or 2–3 approximate at the end of the branches; basal bracts lanceolate, all green; flower-bracts orbicular-cuneate, membranous, as long as the calyx. Calyx ⅙ in. long; lips oblong. Corolla twice as long as the calyx; lower lip ⅙ in. long.

Mozamb. Dist. Kavala Island, in Lake Tanganyika, *Carson!*

4. **A. gracilis**, *Briquet in Engl. Jahrb.* xix. 166. Annual. Stems erect, much-branched, 1–1½ ft. long, finely pubescent. Leaves linear, sessile, denticulate, finely pubescent, acute, 1–1½ in. long, narrowed to the base. Heads solitary at the end of the branches, globose, ⅓–½ in. diam.; basal bracts small, ovate, acute, green throughout; flower-bracts orbicular-cuneate, ⅙ in. long, with long hairs on the back and edges. Calyx as long as the bract; lips oblong, shorter than the tube. Corolla twice as long as the calyx.

Lower Guinea. Angola, *Welwitsch*, 5515!

5. **A. succisæfolius**, *Baker*. Perennial. Stems erect, 1–1½ ft. long, slender, glabrous below, obscurely hairy upwards, bearing about

3 heads on long leafless peduncles. Leaves only a single pair at the middle and another at the fork, lanceolate, sessile, subcoriaceous, nearly glabrous, obscurely toothed, the central pair 2–3 in. long; basal leaves narrowed into a short petiole. Heads globose, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam.; basal bracts small, ovate, green; flower-bracts orbicular-cuneate, very hairy, $\frac{1}{6}$ in. long and broad. Calyx $\frac{1}{8}$ in. long; lips oblong. Corolla twice as long as the calyx.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5608! 5609! 5610!

6. **A. cylindraceus**, *Oliv. in Trans. Linn. Soc.* xxix. 135, t. 132. Annual. Stems erect, much-branched, 3 ft. long, slightly pubescent upwards. Leaves shortly petioled, oblong-lanceolate, obscurely crenate, pubescent on both sides, 1–2 in. long. Heads numerous, laxly corymbose, oblong, $\frac{1}{2}$ in. diam., with 2–4 small ovate green bract-leaves at the base; flower-bracts pale green, orbicular-cuneate, $\frac{1}{6}$ in. broad. Calyx densely hairy, finally $\frac{1}{8}$ in. long; lips as long as the tube. Corolla more than twice as long as the calyx; lips short.—*Briquet in Bull. Soc. Bot. Belg.* xxxvii. 76. *A. verbenaceus*, *Vatke in Linnæa*, xl. 178.

Nile Land. British East Africa: Unyoro district, cultivated in beds near the huts of the natives, *Speke & Grant*, 585! Ruwenzori, 3300 ft., *Scott-Elliot*, 7602!

Lower Guinea. Congo, *Dewèvre*, 993.

Mozamb. Dist. German East Africa: Lake district, *Stuhlmann (ex Gürke)*. Portuguese East Africa: Mainland, opposite Mozambique, *Peters*.

Nearly allied to *A. villosus*, *Benth.*, of Madagascar.

7. **A. oligocephalus**, *Baker in Kew Bulletin*, 1898, 160. Stem slender, erect, 4-angled, finely and shortly hairy. Leaves shortly petioled, lanceolate, 1–1 $\frac{1}{2}$ in. long, crenate, narrowed from the middle to the base, green and pilose on both surfaces. Heads few, globose or oblong, $\frac{1}{2}$ in. diam., remotely and laxly corymbose; basal bracts ovate or oblong, green to the base, hairy on both surfaces; peduncles long; flower-bracts orbicular-cuneate, rigid, brown, hairy, the lower $\frac{1}{6}$ in. broad. Calyx $\frac{1}{8}$ in. long; lips obtuse. Corolla-tube as long as the calyx; lips small.

Mozamb. Dist. British Central Africa: Nyasaland; between Kondowe and Karonga, 2000–6000 ft., *Whyte*! and without precise locality, *Buchanan*, 593!

8. **A. porphyrophyllus**, *Baker*. Stems densely clothed with short spreading hairs. Leaves linear or lanceolate, sessile, denticulate, hairy, especially beneath. Heads densely corymbose at the ends of the branches, oblong or subglobose, $\frac{1}{3}$ in. diam.; basal bracts large, ovate, purple, pubescent; flower-bracts orbicular-cuneate, very hairy, $\frac{1}{6}$ in. long and broad. Calyx not protruded beyond the bract. Corolla not seen.

Mozamb. Dist. German East Africa: without precise locality, *Hannington*!

9. **A. Schweinfurthii**, *Briquet in Engl. Jahrb.* xix. 171. Stems tall, branched; internodes short; branches clothed upwards with

adpressed grey hairs. Leaves petioled, linear, 1-2 in. long, $\frac{1}{24}$ - $\frac{1}{8}$ in. broad, acuminate, narrowed to the base, minutely and shortly serrate, clothed with adpressed grey hairs. Heads globose, $\frac{1}{3}$ in. diam., tomentose, many, forming an ample corymb; lower bracts ovate-lanceolate, tipped with blue-purple. Flower-calyx under $\frac{1}{12}$ in. long, silky; lobes very small. Corolla protruding $\frac{1}{8}$ - $\frac{1}{6}$ in. from the throat of the calyx; lips ovate, $\frac{1}{3}$ lin. long. Stamens exserted.

Nile Land. British East Africa: Jur; Jur Awet and Agada, *Schweinfurth*, 2541, 4273.

10. **A. iododermis**, *Briquet in Engl. Jahrb.* xix. 167. Stem tall, much branched, pubescent. Leaves linear-lanceolate, shortly petioled, about 1 in. long, $\frac{1}{12}$ - $\frac{1}{8}$ in. broad, acute, narrowed to the base, moderately denticulate, green and slightly pubescent on both surfaces. Heads dense, globose, peduncled, $\frac{1}{3}$ - $\frac{1}{2}$ in. long; basal bracts ovate-lanceolate, acuminate, $\frac{1}{2}$ -1 in. long, green at the tip, blue-purple towards the base; flower-bracts much narrower. Calyx finally $\frac{1}{6}$ - $\frac{1}{8}$ in. long; lips small. Corolla protruding $\frac{1}{8}$ in. from the throat of the calyx; lips $\frac{1}{12}$ - $\frac{1}{16}$ in. long. Stamens exserted.

South Central. Lunda: near Mukenge, in Bashilange district, *Pogge*, 1086.

11. **A. Campicola**, *Briquet in Engl. Jahrb.* xix. 167. Stem tall, robust, much branched, pubescent. Leaves shortly petioled, linear, 1-2 $\frac{1}{2}$ in. long, $\frac{1}{8}$ - $\frac{1}{5}$ in. broad, acute, narrowed to the base, minutely denticulate, green on both surfaces, glabrescent or pubescent. Heads dense, cylindrical, peduncled, $\frac{1}{2}$ - $\frac{3}{4}$ in. long; basal bracts ovate, $\frac{1}{3}$ - $\frac{1}{2}$ in. long, whitish at the apex and base; flower-bracts narrower, pilose. Fruit-calyx $\frac{1}{4}$ in. long; upper lip $\frac{1}{12}$ in. long, minutely 3-lobed; lower rather shorter, 2-lobed. Corolla protruded $\frac{1}{4}$ in. from the throat of the calyx; lips $\frac{1}{10}$ - $\frac{1}{8}$ in. long. Stamens exserted.

South Central. Congo Free State: near Nyangwe, on the River Lualaba, *Pogge*, 1075.

Briquet quotes the same number with date and place for *A. oeruleus*, Oliv., var. *genuinus*, *Briquet*.

12. **A. poggeanus**, *Briquet in Engl. Jahrb.* xix. 170. A tall herb with green branches, dark blue on the angles, clothed with firm crisped blue hairs. Leaves petioled, lanceolate, 1 $\frac{1}{2}$ -2 $\frac{1}{2}$ in. long, acuminate, narrowed to the base, closely denticulate-crenate, green and slightly pilose on both surfaces. Heads corymbose, globose, $\frac{1}{4}$ - $\frac{1}{3}$ in. diam.; peduncles clothed with dark blue hairs; basal bracts small, oblong-lanceolate, white at the base and beneath. Mature calyx $\frac{1}{8}$ in. long; lobes very small. Corolla protruding $\frac{1}{8}$ in. from the throat of the calyx; lips very small. Stamens much exserted.

South Central. Lunda: near Mukenge, in Bashilange district, *Pogge*, 1087.

13. **A. polytrichus**, *Baker*. Perennial. Stems much branched, 1 $\frac{1}{2}$ -2 ft. long, densely clothed with short spreading hairs. Leaves con-

gested into whorls, linear, sessile, ascending, denticulate, 2–3 in. long, densely hairy on both sides. Heads densely corymbose at the end of the branches, globose, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam.; basal bracts ovate or lanceolate, very hairy, white towards the base; flower-bracts obovate-cuneate, very shaggy, $\frac{1}{8}$ in. long. Flower-calyx very hairy, $\frac{1}{12}$ in. long. Corolla twice as long as the calyx.

Upper Guinea. Niger Territory: Nupe, common in swampy places, *Barter!*

14. **A. venosus**, *Baker in Kew Bulletin*, 1898, 160. Perennial. Stems erect, densely pubescent, 2 ft. or more long. Leaves opposite, sessile, lanceolate, erecto-patent, entire or obscurely denticulate, 2–3 in. long, ascending, densely pubescent, especially beneath. Heads densely corymbose at the ends of the branches, globose or oblong, $\frac{1}{3}$ in. diam.; basal bracts pale at the base; flower-bracts orbicular-cuneate, very hairy, $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Calyx $\frac{1}{8}$ in. long; lips oblong, much shorter than the tube. Corolla-tube longer than the calyx; limb short.

Mozamb. Dist. German East Africa: on hills, in Karagwe district, 4000–5000 ft., *Scott-Elliott*, 7490! Portuguese East Africa: Lower Zambesi; Lake Nyatunga, near Shupanga, *Kirk!* British Central Africa: Nyasaland; North Nyasaland, *Whyte!* Manganje Hills, 3000 ft., *Kirk!* Shibisa (Chikwawa) to Tshinmuze, 2000–4000 ft., *Kirk!* Blantyre, *Buchanan*, 114! 132! and without precise locality, *Buchanan*, 266!

15. **A. coeruleus**, *Oliv. in Trans. Linn. Soc.* xxix. 135, t. 133. Perennial. Stems 3–4 ft. long, much-branched, thinly hairy. Leaves congested into whorls, sessile, ascending, linear, obscurely denticulate, 2–3 in. long, slightly hairy. Heads densely corymbose at the end of the branches, globose, $\frac{1}{3}$ in. diam.; basal bracts many, large, ovate, white; flower-bracts orbicular-cuneate, hairy, $\frac{1}{6}$ in. long. Calyx villous, $\frac{1}{8}$ in. long; lips short, orbicular; lower emarginate. Corolla three times as long as the calyx.

Nile Land. British East Africa; Ukidi, near water, *Speke & Grant*, 632! Kavirondo, on dry laterite, 4000 ft., *Scott-Elliott*, 7153!

South Central. Congo Free State: near Nyangwe, on the River Lualaba, *Pogge*, 1075 (var. *genuinus*, Briquet in Engl. Jahrb. xix. 166). Lunda: Lulua River, *Pogge*, 358 (var. *trichosoma*, Briquet, loc. cit.).

Mozamb. Dist. German East Africa: between Lake Tanganyika and Lake Rukwa, 6000 ft., *Nutt!* British East Africa: Urungu; Fwambo, 5200 ft., *Nutt!* *Carson*, 8! 44! 45! Niumkolo, Hore Bay, *Carson!* Nyasaland; Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte!*

16. **A. lilacinus**, *Oliv. in Trans. Linn. Soc.* xxix. 135, t. 134. Perennial. Stems much branched, 2–3 ft. long, densely hairy. Leaves congested into whorls with short internodes, linear-lanceolate, denticulate, sessile, deflexed, 1–1 $\frac{1}{2}$ in. long, hairy on both sides. Heads in dense corymbs at the ends of the branches, globose, $\frac{1}{3}$ in. diam.; basal bracts large, ovate, pale, with foliaceous tips; flower-bracts orbicular-cuneate, cuspidate, greenish, pubescent, $\frac{1}{8}$ in. long. Calyx $\frac{1}{8}$ in. long,

deeply bilabiate, lips oblong. Corolla pale lilac, three times the length of the calyx.

Upper Guinea. Gold Coast : Adofi, *Krause* !

Nile Land. British East Africa : Bongo ; Sabbi River, *Schweinfurth*, 2640 !
Uganda, in grass land, *Wilson*, 44 !

Mozamb. Dist. German East Africa : Usui, 4200 ft., *Speke & Grant*, 139 !

17. **A. lagoensis**, *Baker in Kew Bulletin*, 1895, 152. A perennial, with erect densely pubescent stems. Leaves many, sessile, linear, 2–3 in. long, dentate, deflexed, moderately firm, pubescent on both surfaces. Heads many, globose, $\frac{1}{2}$ in. diam., forming dense terminal corymbs ; basal bracts ovate or rhomboid, pale throughout, densely pubescent ; flower-bracts orbicular-cuneate, densely pilose. Calyx densely pilose, $\frac{1}{8}$ in. long. Corolla glabrous ; tube slender, rather longer than the calyx ; lips small.

Upper Guinea. Interior of Western Lagos, *Rowland* !

18. **A. Buettneri**, *Gürke in Engl. Jahrb.* xix. 198. Stem branched, erect, clothed with long silky adpressed hairs. Leaves lanceolate, acute, narrowed to a very short petiole, $1\frac{1}{2}$ –2 in. long, entire or obscurely toothed, deflexed, densely clothed on both sides with long yellowish adpressed silky hairs. Heads subglobose ; outer bracts 3–4, deltoid or lanceolate-deltoid, acuminate, silky, $\frac{1}{3}$ – $\frac{1}{2}$ in. long ; flower-bracts ovate or rhomboid-apiculate, longer than the calyx, pilose ; pedicels $\frac{1}{2}$ lin. long. Calyx in fruit $\frac{1}{12}$ in. long, clothed with long hairs ; upper lip entire, rounded at the apex ; lower 3-toothed. Corolla white ; tube twice the length of the calyx.

Upper Guinea. Togoland : near Bismarckburg, *Büttner*, 304 !

19. **A. callianthus**, *Briquet in Engl. Jahrb.* xix. 169. Annual. Stems erect, much-branched, $1\frac{1}{2}$ –2 ft. long, thinly clothed with short spreading bristly white hairs. Stem-leaves shortly petioled, oblong-lanceolate, crenate, 2–3 in. long, thinly hairy on both sides. Heads corymbose at the end of the branches, crowded, globose, $\frac{1}{3}$ – $\frac{1}{2}$ in. diam. ; basal bracts ovate, pale at the base ; flower-bracts orbicular-cuspidate, $\frac{1}{6}$ in. long and broad. Fruit-calyx $\frac{1}{6}$ in. long ; tube strongly ribbed ; lips oblong. Corolla twice as long as the calyx.—*A. zambesiacus*, *Baker ex Gürke in Engl. Pfl. Ost-Afr. C.* 348.

Mozamb. Dist. Portuguese East Africa : Quilimane, *Scott* ! Makua ; Namuli Hills, *Last* ! Unangu to Lake Shirwa, *Johnson*, 28 ! British Central Africa : Nyasaland ; Shire Highlands, *Buchanan*, 87 ! Manganja Hills, 3000 ft., *Kirk* ! *Meller* ! near Blantyre, *Last* ! Mount Chiradzulu, 4000 ft., *Whyte* ! North Nyasa, *Whyte* ! and without precise locality, *Buchanan*, 403 ! 424 !

20. **A. præaltus**, *Briquet in Engl. Jahrb.* xix. 168. Perennial. Stem erect, much-branched, 3–4 ft. long, slightly hairy. Leaves distant, petioled, oblong, crenate, subcoriaceous, subscabrous above, bristly with raised veins beneath, 2–3 in. long. Heads many, laxly corymbose ; globose, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam. ; basal bracts small, ovate, green ; flower-bracts

orbicular, pubescent, $\frac{1}{8}$ in. long and broad. Calyx as long as the bract; lips oblong. Corolla twice as long as the calyx.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5600!

21. **A. lippioides**, *Baker*. Perennial. Stem slender, erect, densely pubescent, branched only at the top. Stem-leaves oblong-lanceolate, petioled, subcoriaceous, minutely crenate, glabrous above, pubescent beneath, the lower 5–6 in. long. Heads few, small, corymbose, globose; basal bracts ovate or orbicular, pilose; flower-bracts cuneate, $\frac{1}{8}$ in. broad. Calyx nearly as long as the flower-bract. Corolla large for the genus, $\frac{1}{4}$ in. long. Stamens slightly exerted.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5550!

22. **A. Heudelotii**, *Briquet in Bull. Herb. Boiss.* ii. 689. Perennial. Stems erect, much-branched, finely pubescent, $1\frac{1}{2}$ –2 ft. long. Leaves congested into whorls, linear, sessile, entire, $1\frac{1}{2}$ –2 in. long, narrowed to the base, finely pubescent on both sides. Heads in dense corymbs at the end of the branches, globose, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam.; basal bracts linear, entirely foliaceous; flower-bracts obovate-cuneate, pale, densely hairy, $\frac{1}{8}$ in. long. Flower-calyx $\frac{1}{8}$ in. long; lips oblong, as long as the tube. Corolla twice as long as the calyx, pale violet.

Upper Guinea. Senegambia: banks of the Rio Nunez, *Heudelot!* and without precise locality, *Heudelot*, 620! French Guinea: Sulimania; Herimankuna, *Scott-Elliot*, 5262!

Nile Land. British East Africa: Jur: Agada, near Jur Ghattas, *Schweinfurth*, 2470! 2541! Jur Awet, *Schweinfurth*, 4273!

23. **A. Laurentii**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 79. A tall perennial herb. Stem robust, tetragonous, clothed with crisped hairs. Leaves sessile or subsessile, narrowly lanceolate, $1\frac{1}{2}$ in. long, very acute, entire or irregularly serrate, dull green and pubescent on both surfaces. Heads shortly peduncled, crowded in dense corymbs, depresso-globose, $\frac{1}{3}$ – $\frac{1}{2}$ in. diam.; outer bracts round-ovate, $\frac{1}{2}$ in. long, emarginate, mucronate, densely pubescent on both surfaces except at the base; flower-bracts with long hairs on the edge. Flower-calyx pubescent, $\frac{1}{12}$ in. long; lips 3–4 times the length of the tube. Corolla protruding $\frac{1}{6}$ in. from the throat of the calyx; lips $\frac{1}{4}$ the length of the tube.

South Central. Congo Free State: Lusambo, on the River Sankuru, *Laurent*.

24. **A. reticulatus**, *Briquet in Engl. Jahrb.* xix. 168. Stem very robust; internodes moderately long; branchlets clothed with ferruginous tomentum. Leaves subsessile, lanceolate, $1\frac{1}{2}$ –3 in. long, acute, narrowed to the base, closely and finely serrate, green and glabrous above, green and pubescent with close prominent ribs beneath. Heads globose, $\frac{1}{2}$ – $\frac{3}{4}$ in. long, rufo-tomentose; basal bracts ovate, acute, $\frac{1}{3}$ – $\frac{1}{2}$ in. long, dull green, tomentose. Flower-calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long; lips very

small. Corolla protruding $\frac{1}{6}$ in. from the throat of the calyx; lips very small. Stamens exserted.

Lower Guinea. Angola: Malange, *Mechow*, 431.

25. **A. dissitifolius**, *Baker*. Perennial. Stem erect, 2–3 ft. long, slightly pubescent upwards. Leaves distant, opposite, lanceolate, nearly entire, subsessile, 2–3 in. long, much narrowed to the base, obscurely pubescent. Heads few, corymbose, globose, $\frac{1}{3}$ in. diam.; basal bracts ovate or lanceolate, entirely green; flower-bracts purplish, orbicular-cuneate, slightly hairy, membranous, $\frac{1}{8}$ in. long and broad. Flower-calyx hairy, shorter than the bract. Corolla under $\frac{1}{4}$ in. long.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5611!

26. **A. mechowianus**, *Briquet in Engl. Jahrb.* xix. 168. Stem robust, branched; internodes very long; branches pubescent. Leaves very shortly petioled, lanceolate, 3–4 in. long, $\frac{1}{2}$ –1 in. broad, acuminate, narrowed to the base, minutely crenate, rather scabrous above, paler and pubescent below, with close raised veins. Heads very numerous, corymbose, depresso-globose, $\frac{1}{3}$ – $\frac{1}{2}$ in. diam.; basal bracts ovate-lanceolate, $\frac{1}{3}$ – $\frac{1}{2}$ in. long, green, rugose, clothed with white tomentum towards the base. Flower-calyx $\frac{1}{8}$ in. long; lobes very small. Corolla protruding $\frac{1}{12}$ in. from the throat of the calyx; lips $\frac{1}{2}$ lin. long. Stamens exserted.

Lower Guinea. Angola: Malange, *Mechow*, 444.

27. **A. Welwitschii**, *Briquet in Engl. Jahrb.* xix. 169. Perennial. Stems tall, much-branched, thinly clothed with short spreading bristly hairs. Leaves distant, small, spreading, lanceolate, sessile, obscurely crenate, hairy on both sides. Heads many in a corymb at the end of the branches, globose, $\frac{1}{4}$ in. diam.; basal bracts small, green, ovate or lanceolate; flower-bracts membranous, pale green, orbicular, $\frac{1}{8}$ in. long. Calyx densely hairy, as long as the bract. Corolla twice as long as the calyx.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5549!

28. **A. sericeus**, *Briquet in Engl. Jahrb.* xix. 170. Perennial. Stems stiffly erect, much-branched, $1\frac{1}{2}$ –2 ft. or more long, densely pubescent. Leaves congested into whorls, densely pubescent, lanceolate, entire, sessile, 1–3 in. long, narrowed to the base, pubescent on both sides. Heads densely corymbose at the end of the branches, globose, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam.; basal bracts lanceolate, entirely green; flower-bracts green, pubescent, orbicular-cuneate, cuspidate, $\frac{1}{8}$ in. long and broad. Calyx as long as the bract. Corolla half as long again as the calyx; lips short. Style exserted, very shortly bifid.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5551! 5603!

29. **A. hyptoides**, *Baker*. Perennial. Stems much branched, slightly hairy, decumbent. Stem-leaves lanceolate; lower 5–6 in. long,

denticulate, narrowed very gradually to the base, pubescent on both sides. Heads globose, corymbose, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam.; basal bracts ovate, green to the base; flower-bracts pale green, pubescent, orbicular, $\frac{1}{8}$ in. long. Flower-calyx $\frac{1}{8}$ in. long; lips oblong. Corolla twice as long as the calyx.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5606! 5607!

30. **A. masuianus**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 80. A tall perennial herb. Stem robust, branched, clothed with ferruginous hairs. Leaves sessile, lanceolate, 2–3 in. long, acute or acuminate, minutely crenate, narrowed to the base, dull green and softly villous on both surfaces. Heads depresso-globose, forming a dense corymb; outer bracts broadly ovate, $\frac{1}{3}$ – $\frac{1}{2}$ in. long, deeply crenate, clothed with white hairs. Flower-calyx ovoid, finally $\frac{1}{6}$ – $\frac{1}{5}$ in. long, clothed with long hairs; upper lip $\frac{1}{5}$ – $\frac{1}{4}$ in. long. Corolla protruded $\frac{1}{5}$ in. from the throat of the calyx; upper lip 3-lobed, nearly as long as the tube.—*De Wild. & Durand*, Ill. Fl. Congo, i. t. 13.

Lower Guinea. Lower French Congo: forest of Mayombe, *Dupuis*.

31. **A. Hensii**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 77. A medium-sized perennial herb, with pubescent tetragonous branches. Leaves subsessile, oblong-lanceolate, 2–3 in. long, entire, narrowed to the base, dull green, shortly pubescent and gland-dotted on both surfaces. Heads cylindrical, peduncled, $\frac{1}{2}$ in. long; outer bracts ovate-oblong, foliaceous, grey-green; flower-bracts obovate, as long as the calyx, clothed principally on the edge with long hairs. Flower-calyx hairy, $\frac{1}{8}$ in. long; upper lip round-ovate, entire; lower shorter, with 2 minute teeth. Corolla dark lilac, protruded $\frac{1}{8}$ in. from the throat of the calyx; lips much shorter than the tube. Stamens exerted.

Lower Guinea. Lower Congo: marsh of Stanley Pool, *Hens*, 42.

32. **A. minor**, *Briquet in Engl. Jahrb.* xix. 169. Stem dwarf, clothed with adpressed hairs. Leaves sessile, oblong-lanceolate, above 1 in. long subacute, narrowed to the base, distantly toothed, green and pilose on both surfaces. Heads forming a lax corymb, depresso-globose, $\frac{1}{4}$ – $\frac{1}{3}$ in. diam.; basal bracts green, ovate. Flower-calyx $\frac{1}{2}$ in. long. Corolla protruding $\frac{1}{8}$ – $\frac{1}{6}$ in. from the throat of the calyx; lips very small. Stamens exerted.

Lower Guinea. Angola, *Welwitsch*, 5605! (5905 ex *Briquet* by error).

33. **A. elongatus**, *Briquet in Engl. Jahrb.* xix. 171. Stem tall, robust, branched, green, slightly pilose; internodes long. Leaves petioled, ovate or oblong-lanceolate, $1\frac{1}{2}$ – $2\frac{1}{2}$ in. long, acuminate, narrowed to the base, regularly crenate or dentate; green and slightly hairy on both surfaces. Heads globose, sessile or subsessile, forming a congested panicle 3–4 in. long; flower-bracts like reduced leaves in colour and

texture. Fruit-calyx $\frac{1}{6}$ – $\frac{1}{3}$ in. long; lobes very small. Corolla protruding $\frac{1}{12}$ in. from the throat of the calyx. Stamens exerted.

South Central. Congo Free State: between Nyangwe and Kimbundu, *Pogge*, 1014.

34. **A. angolensis**, *Gürke in Engl. Jahrb.* xix. 198. Stems simple, erect, 3–4 ft. long, densely clothed with spreading hairs; internodes very long. Leaves shortly petioled, oblong-lanceolate, acute, 3–4 in. long, 1–1½ in. broad, narrowed to the base, crenate, sparsely villous on both sides. Heads few, subglobose; outer bracts 3–4, rhomboid or lanceolate-deltoid, crenate, pilose on both sides; flower-bracts rhomboid-cuneate, twice as long as the calyx; pedicels short. Flower-calyx under a line long; lobes round, glabrescent, ciliate. Corolla $\frac{1}{4}$ in. long; tube 3–4 times the length of the calyx; lobes villous outside.

Lower Guinea. Angola: Malange, *Mechow*, 358.

35. **A. divaricatus**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 76. A tall branched perennial herb, with divaricate branches thinly clothed with crisped hairs. Leaves shortly petioled, oblong, $\frac{1}{2}$ –1 in. long, acute or subobtuse, crenate, green and clothed with crisped hairs on both surfaces. Heads globose-cylindrical, reaching $\frac{1}{3}$ in. long; outer bracts foliaceous; flower-bracts broadly rhomboidal, $\frac{1}{6}$ in. long. Calyx finally $\frac{1}{8}$ in. long, with a few spreading hairs; lips both entire. Corolla pale lilac; tube $\frac{1}{8}$ in. long; lips shorter than the tube. Stamens exerted.

Lower Guinea. Congo, in marshes, *Dewèvre*.

36. **A. paniculatus**, *Briquet in Engl. Jahrb.* xix. 172. Stem robust, branched, clothed with short adpressed firm hairs. Leaves shortly petioled, oblong-lanceolate, 1½–2½ in. long, $\frac{1}{3}$ – $\frac{1}{2}$ in. broad, subacute or subobtuse, narrowed to the base, regularly and closely crenate, green and slightly hispid on both surfaces. Capitula congested in heads, which form a panicle $\frac{1}{2}$ ft. long; lower bracts like leaves in colour and texture. Fruit-calyx $\frac{1}{4}$ in. long; lips ovate, entire, $\frac{1}{4}$ – $\frac{1}{3}$ lin. long. Corolla and stamens not seen.

South Central. Lunda: Mussumba, *Pogge*, 370.

Imperfectly known species.

37. **A. Fischeri**, *Gürke in Engl. Pfl. Ost-Afr. C.* 348. Branches pubescent. Leaves lanceolate, acuminate, narrowed to a short petiole, serrate, pubescent on both sides. Heads subglobose; basal bracts rhomboid-lanceolate. Fruit-calyx bilabiate; upper lips subacute, lower rounded at the apex.

Mozamb. Dist. German East Africa: Wadiboma (? Kwadiboma, near Mgera, in Nguru district), *Fischer*, 503.

7. **ORTHOSIPHON**, Benth.; Benth. et Hook. f. Gen. Pl. ii. 1174.

Calyx deflexed in fruit; tube campanulate or subcylindrical; upper tooth ovate, with the margins decurrent; lateral and lower teeth smaller. Corolla-tube cylindrical, usually longer than the calyx; limb bilabiate; lower lip very slightly concave. Stamens 4, didynamous, declinate; filaments filiform; anthers 1-celled. Disk glandular. Stigma capitate; nucules ovoid, smooth or minutely rugose.—Herbs or undershrubs. Whorls forming long racemes. Stamens included or exserted. Habit of *Ocimum*, from which it differs by its long corolla-tube and capitate stigma.

Species about 60, spread through the warmer regions of the Old World.

°Stamens not exserted beyond the lips of the corolla.

††Leaves sessile or subsessile.

Corolla twice as long as the calyx.

Rootstock tuberous 1. *O. tuberosus*.

Rootstock not tuberous 2. *O. tenuiflorus*.

Corolla less than twice as long as the calyx.

Leaves lanceolate 3. *O. parvifolius*.

Leaves oblong-lanceolate 4. *O. bartsioides*.

Leaves ovate-oblong 5. *O. retinervis*.

Leaves ovate.

Corolla not much longer than the calyx 6. *O. menthaefolius*.

Corolla half as long again as the calyx 7. *O. scabridus*.

††Leaves shortly petioled.

Leaves oblong-lanceolate 8. *O. salogensis*.

Leaves oblong.

Leaves thinly hairy 9. *O. shirensis*.

Leaves densely hairy 10. *O. tubulascens*.

Leaves ovate-lanceolate 11. *O. cladotrichos*.

Leaves ovate.

Leaves very small.

Calyx $\frac{1}{2}$ in. long 12. *O. mollis*.

Calyx $\frac{1}{3}$ in. long.

Leaves acute 13. *O. mombasicus*.

Leaves subobtuse 14. *O. calaminthoides*.

Calyx $\frac{1}{3}$ in. long 15. *O. roseus*.

Calyx $\frac{1}{4}$ in. long 16. *O. pallidus*.

Leaves not very small.

Leaves glabrous.

Leaves regularly crenate 17. *O. heterochrous*.

Leaves deeply inciso-crenate 18. *O. Stuhlmanni*.

Leaves pubescent.

Corolla a little longer than the calyx 19. *O. violaceus*.

Corolla half as long again as the calyx 20. *O. villosus*.

Corolla more than twice as long as the calyx 21. *O. usambarensis*.

Leaves obovate-obtuse.

Leaves not very small 22. *O. dissitifolius*.

Leaves very small 23. *O. malosanus*.

Leaves orbicular 24. *O. Wakefieldii*.

- ††† Leaves with a long petiole.
- Corolla-tube rather longer than the calyx 25. *O. Schimperii*.
- Corolla-tube half as long again as the calyx.
- Calyx finely pubescent.
- Leaves acute 26. *O. somalensis*.
- Leaves obtuse 27. *O. Hildebrandtii*.
- Calyx densely hairy 28. *O. coloratus*.
- Corolla-tube twice as long as the calyx.
- Leaves oblong-lanceolate 29. *O. Johnstonii*.
- Leaves ovate, acute.
- Petiole much shorter than the blade 30. *O. nyasicus*.
- Petiole nearly as long as the blade 31. *O. longipes*.
- Leaves ovate, obtuse 32. *O. australis*.
- ⊙⊙ Stamens exerted beyond the lips of the corolla.
- Bracts minute, deciduous.
- Corolla a little longer than the calyx.
- Leaves oblong-lanceolate 33. *O. Cameroni*.
- Leaves oblong 34. *O. iodocalyx*.
- Leaves cordate-ovate 35. *O. breviflorus*.
- Corolla more than twice as long as the calyx.
- Leaves sessile, linear 36. *O. linearis*.
- Leaves petiolate, oblong-lanceolate 37. *O. liebrechtsianus*.
- Upper bracts crowded, persistent.
- Annuals.
- Raceme short 38. *O. schinzianus*.
- Raceme long 39. *O. bracteosus*.
- Perennials.
- Stems finely pubescent.
- Corolla-tube short 40. *O. Marquesii*.
- Corolla-tube half as long again as the calyx 41. *O. Welwitschii*.
- Corolla-tube twice as long as the calyx 42. *O. Kirkii*.
- Stems very hairy 43. *O. Elliottii*.

1. ***O. tuberosus***, *Briquet in Engl. Jahrb.* xix. 172. Perennial. Root-fibres wiry, thickened into oblong tubers. Stems tufted, short, erect, simple, slender, densely pubescent. Leaves small, sessile, entire, oblong or lanceolate, pubescent on both sides. Whorls 2-flowered, forming a lax, terminal raceme; bracts minute; pedicels pubescent, $\frac{1}{8}$ in. long. Calyx pubescent, $\frac{1}{8}$ in. long; tube campanulate; upper tooth small, ovate, shorter than the tube; lateral and lower small cusps. Corolla-tube twice as long as the calyx; lobes small. Stamens not exerted

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5474!

2. ***O. tenuiflorus***, *Benth. in DC. Prod.* xii. 50. A low much-branched perennial, with woody main stems and slender pubescent branchlets. Leaves sessile or shortly petioled, firm, small, narrow, obovate-cuneate, crenate, pubescent. Whorls few-flowered, forming lax terminal racemes; bracts minute; pedicels shorter than the calyx, pubescent like the rhachis. Fruit-calyx $\frac{1}{8}$ in. long; tube campanulate, strongly ribbed; upper tooth orbicular, shorter than the tube; lateral teeth small cusps; lower large cusps. Corolla white, more than twice as

long as the calyx; tube hairy at the throat; lobes small. Stamens not exerted.—*Ocimum depauperatum*, Vatke in Linnæa, xliii. 84.

Nile Land. Somaliland: Ahl Mountains, near Maid, 2700–4000 ft., *Hildebrandt*, 1561! Harradigit, *James & Thrupp*! Gerar Amaden, *Terracciano*.

Also in Socotra and Arabia.

3. **O. parvifolius**, *Vatke in Linnæa*, xliii. 87. Stems perennial, erect, much-branched, slightly pubescent. Leaves sessile, ascending, lanceolate, distantly toothed, pubescent on both sides, 1 in. long. Whorls few-flowered, forming a lax terminal raceme; bracts minute; pedicels short, hairy. Calyx pubescent, $\frac{1}{8}$ in. long; upper lip small, ovate; lateral and lower teeth minute cusps. Corolla-tube scarcely longer than the calyx; lobes small. Stamens not exerted.

Nile Land. British East Africa: Ukamba; Kitui, *Hildebrandt*, 2745!

4. **O. bartsioides**, *Baker*. Perennial. Stems long, slender, erect, branched, slightly hairy. Leaves firm, sessile, oblong-lanceolate, crenate, pubescent on both sides, the lower $1\frac{1}{2}$ –2 in. long. Whorls 2-flowered, forming a long lax raceme; bracts minute; pedicels $\frac{1}{8}$ in. long, like the rhachis densely pubescent. Calyx pubescent, finally $\frac{1}{4}$ in. long; tube oblong; upper tooth orbicular, much shorter than the tube; lateral and lower teeth large cusps. Corolla-tube half as long again as the calyx; lobes small. Stamens not exerted.

Nile Land. British East Africa: Niamniam; Seriba Merdyan, *Schweinfurth*, 3850!

5. **O. retinervis**, *Briquet in Engl. Jahrb.* xix. 175. Stem tall, branched; branches clothed with crisped ferruginous hairs. Leaves subsessile, ovate-oblong, $\frac{1}{2}$ –1 in. long, obtuse or subacute, narrowed to the base, coriaceous, regularly crenate, scabrous on both surfaces; veins raised beneath. Racemes 4–5 in. long; whorls distant, many-flowered; bracts deciduous; pedicels densely pubescent, $\frac{1}{8}$ in. long. Flower-calyx $\frac{1}{8}$ in. long; upper tooth ovate, the others setaceous. Corolla protruding $\frac{1}{8}$ in. from the throat of the calyx; lips both $\frac{1}{12}$ in. long. Stamens included.

Lower Guinea. Angola: Cissacala (? Sacalla), near the River Kuango, *Mechow*, 553.

6. **O. menthæfolius**, *Briquet in Engl. Jahrb.* xix. 176. A perennial herb, with the habit of *Ocimum basilicum*. Stems erect, pubescent. Leaves nearly sessile, ovate, deflexed, deeply crenate, 1– $1\frac{1}{2}$ in. long, pubescent on both sides. Racemes short, moderately dense; rhachis very pubescent; flowers about 4 in a whorl; bracts small, deciduous; pedicels short, very hairy. Fruit-calyx $\frac{1}{8}$ in. long; upper lip orbicular, about as long as the tube; lower teeth large cusps. Corolla not much longer than the calyx. Stamens short; upper filaments not appendiculate. Style clavate.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5475!

7. **O. scabridus**, *Briquet in Engl. Jahrb.* xix. 175. A tall herb, with green branches, clothed with spreading and crisped hairs. Leaves subsessile, broadly ovate, $1\frac{1}{2}$ –2 in. long, obtuse, rounded or subcordate at the base, regularly crenate, scabrous on both surfaces. Racemes lax, 4–5 in. long; pedicels pilose, $\frac{1}{5}$ in. long; bracts small, lanceolate, persistent. Calyx in flower $\frac{1}{5}$ in. long; upper tooth ovate, decurrent, the others lanceolate-subulate. Corolla protruding $\frac{1}{5}$ in. from the throat of the calyx; lips small, subequal. Stamens included.

Lower Guinea. Angola: Malange, *Mecñow*, 442.

8. **O. salagensis**, *Baker*. Stems square, erect, slender, branched, glabrous. Leaves shortly petioled, oblong-lanceolate, acute, conspicuously serrate, obscurely pubescent, cuneate and entire at the base, 1 – $1\frac{1}{2}$ in. long, whorls few-flowered, forming long lax terminal racemes; bracts minute; pedicels $\frac{1}{12}$ – $\frac{1}{8}$ in. long. Fruit-calyx $\frac{1}{4}$ in. long; tube oblong, curved; upper tooth small, orbicular; lateral teeth small cusps; lower larger cusps. Corolla-tube cylindrical, a little longer than the calyx; lobes small. Stamens not exerted.

Upper Guinea. Dagomba: Salaga, on the Upper Volta, *Krause*!

9. **O. shirensis**, *Baker*. A much-branched erect perennial herb. Stems thinly hairy. Leaves shortly petioled, oblong, the lower 2–3 in. long, cuneate at the base, distinctly crenate, thinly hairy on both surfaces. Racemes 3–4 in. long, forming a lax terminal panicle; pedicels short, very hairy; bracts small, ovate, persistent, reddish. Calyx broadly funnel-shaped, $\frac{1}{6}$ in. long; upper tooth broadly ovate; lateral teeth deltoid-cuspidate; lower longer, lanceolate, $\frac{1}{12}$ in. long. Corolla-tube rather longer than the calyx; lips small. Stamens not exerted.

Mozamb. Dist. British Central Africa: Nyasaland; without precise locality, *Buchanan*, 137!

10. **O. tubulascens**, *Briquet in Engl. Jahrb.* xix. 174. Perennial. Stems erect, much branched, densely pubescent. Leaves small, shortly petioled, oblong, with a cuneate base, crenate, densely hairy on both sides. Whorls few-flowered, forming a long lax terminal raceme; bracts minute; pedicels very short, densely hairy. Calyx finally $\frac{1}{6}$ in. long; tube campanulate; upper tooth orbicular, as long as the tube; lateral and lower teeth large cusps. Corolla-tube cylindrical, half as long again at the calyx; lobes small. Stamens not exerted.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5492!

11. **O. cladotrichos**, *Gürke in Engl. Pfl. Ost-Afr. C.* 349. A branched herb, with velvety-pubescent stems. Leaves shortly petioled, ovate-lanceolate, 1–2 in. long, acuminate, narrowed to the base, deeply serrate, pubescent above, velvety beneath. Whorls 6-flowered, forming lax racemes. Calyx naked inside at the throat; upper tooth broadly ovate, with slightly decurrent margins; lateral teeth deltoid-cuspidate; lower setaceous. Stamens included.

Mozamb. Dist. German East Africa: Usambara; Nyika, *Holst*, 3922.

12. **O. mollis**, *Baker in Kew Bulletin*, 1895, 225. A perennial herb, with pubescent branchlets. Leaves shortly petioled, ovate, $\frac{1}{4}$ – $\frac{1}{3}$ in. long, obtuse, crenate, broadly rounded at the base, densely pubescent on both surfaces. Racemes lax, simple; whorls 5–6-flowered; pedicels short; bracts minute. Calyx pubescent, $\frac{1}{12}$ in. long; tube campanulate; upper tooth ovate, the others lanceolate. Corolla-tube cylindrical, $\frac{1}{4}$ in. long; lips small, oblong. Stamens not exerted.

Nile Land. Somaliland: Golis Range, *Mrs. Lort-Phillips!*

13. **O. mombasicus**, *Baker*. Stems very slender, erect, branched, slightly pubescent upwards. Leaves shortly petioled, small, ovate, acute, crenate, slightly pubescent. Whorls few-flowered, forming a very lax terminal raceme; bracts minute; pedicels shorter than the calyx. Calyx finally $\frac{1}{8}$ in. long; tube funnel-shaped; upper lip sub-orbicular, much shorter than the tube; lateral teeth small cusps; lower larger cusps. Corolla-tube cylindrical, twice as long as the calyx; lobes small. Stamens not exerted.

Nile Land. British East Africa: Mombasa, *Wakefield!*

14. **O. calaminthoides**, *Baker in Kew Bulletin*, 1895, 225. A much-branched undershrub, with pubescent branchlets. Leaves shortly petioled, ovate, $\frac{1}{3}$ – $\frac{1}{2}$ in. long, subobtuse, crenate, green and pubescent on both surfaces. Racemes simple, long, lax; whorls 2–6-flowered; pedicels longer than the calyx; bracts minute. Calyx pubescent, $\frac{1}{8}$ in. long; tube cylindrical; teeth minute; upper ovate and obtuse; lower linear. Corolla-tube cylindrical, $\frac{1}{4}$ in. long; lips small; upper shorter; lower lingulate. Stamens not exerted. Style entire at the top.

Nile Land. Somaliland: Golis range, *Mrs. Lort-Phillips!*

15. **O. roseus**, *Briquet in Engl. Jahrb.* xix. 174. Stems slender, erect, much branched, slightly pubescent upwards. Leaves shortly petioled, small, ovate, acute, crenate, slightly pubescent. Whorls many, few-flowered, forming a lax terminal raceme; bracts minute; pedicels short, pubescent. Fruit-calyx $\frac{1}{6}$ in. long; upper tooth orbicular, shorter than the oblong tube; lateral teeth small cusps; lower larger cusps. Corolla rose-red; tube cylindrical, twice as long as the calyx; lobes small. Stamens not exerted.

Nile Land. British East Africa: Bongo; by the River Roa, *Schweinfurth*, 2765! Niamniam; by the River Mabode, *Schweinfurth*, 3818!

16. **O. pallidus**, *Royle; Benth. in DC. Prod.* xii. 50. Perennial, much branched from the base; stems short, densely pubescent. Leaves shortly petioled, small, ovate, obtuse, crenate, pubescent on both sides. Whorls few-flowered, forming a lax terminal raceme; bracts minute; rhachis pubescent; pedicels shorter than the calyx. Calyx pubescent, finally $\frac{1}{4}$ in. long; tube oblong; upper lobe orbicular, shorter than the tube; lateral and lower large cusps. Corolla twice as long as the calyx; lobes small. Stamens not exerted.—*Hook. f. Fl. Brit. Ind.* iv.

613. *O. Ehrenbergii*, Vatke in Linnæa, xxxvii. 316. *Ocimum reflexum*, Ehrenb. ex Schweinf. Beitr. Fl. Æthiop. 126. *O. nepetæfolium*, Hochst. ex Vatke, l. c. *O. reflexus*, var. *pallidus*, Terracciano in Ann. Istit. Bot. Roma. v 101.

Nile Land. Island of Dalak, *Ehrenberg*. Nubia: Erkowit Mountain, near Suakin, *Schweinfurth*, 277! Eritrea: near Massowa, *Ehrenberg*; Ailet, *Ehrenberg*; Ginda, 3000 ft., *Schweinfurth*, 302! near Saati, *Schweinfurth & Riva*, 330! Abyssinia, *Schimper*.

Also in Arabia and North-West India.

17. ***O. heterochrous***, *Briquet in Engl. Jahrb.* xix. 173. A branched herb, with reddish-green glabrescent stems. Leaves subsessile or shortly petioled, ovate or ovate-oblong, about 1 in. long, acute or subacute, narrowed to the base, regularly crenate, glabrous on both surfaces. Racemes 3-4 in. long, lax towards the base; bracts deciduous; axis densely ferrugino-pubescent; pedicels $\frac{1}{8}$ in. long. Calyx violet, ferrugino-pubescent, especially at the base, $\frac{1}{6}$ in. long in flower; upper tooth ovate, the others setaceous. Corolla protruding $\frac{1}{8}$ - $\frac{1}{6}$ in. from the throat of the calyx; lower lip $\frac{1}{12}$ in. long. Stamens reaching the tip of the lower lip.

Lower Guinea. Angola: at the River Kuango, *Pogge*, 366.

18. ***O. Stuhlmannii***, *Gürke in Engl. Pfl. Ost-Afr. C.* 349. A branched herb, with pubescent stems. Leaves shortly petioled, ovate or ovate-lanceolate, 1-1 $\frac{1}{2}$ in. long, narrowed to the base, deeply incisocrenate, glabrous on both surfaces. Whorls 6-flowered, forming lax racemes; bracts broadly ovate, acute. Calyx naked inside at the throat; upper tooth suborbicular, obtuse; lateral teeth deltoid-cuspidate; lower setaceous. Stamens included.

Mozamb. Dist. German East Africa: Mwanza, on the Victoria Nyanza, *Stuhlmann*, 4168.

19. ***O. violaceus***, *Briquet in Engl. Jahrb.* xix. 178. Perennial. Stem short, decumbent, purple, thinly hairy. Leaves shortly petioled, ovate, obtuse, crenate, rounded at the base, rigidly coriaceous, 1 $\frac{1}{2}$ in. long, obscurely pubescent beneath, with raised veins. Raceme short; whorls many-flowered; pedicels very short; bracts as long as the calyx. Calyx $\frac{1}{6}$ in. long; upper lip orbicular, as long as the campanulate tube; lower cusps small. Corolla a little longer than the calyx. Stamens as long as the corolla. Upper filaments naked.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5473!

20. ***O. villosus***, *Briquet in Engl. Jahrb.* xix. 177. A perennial herb. Stem erect, clothed with short hairs. Leaves shortly petioled, ovate, crenate, rounded at the base, 1-1 $\frac{1}{2}$ in. long, moderately firm, thinly pubescent on both sides. Racemes lax, 2-3 in. long; rhachis hairy; flowers about 6 in a whorl; bracts lanceolate, small; pedicels $\frac{1}{8}$ - $\frac{1}{6}$ in. long. Fruit-calyx $\frac{1}{6}$ in. long; upper lip ovate, shorter than the tube; lower cusps moderately large. Corolla $\frac{1}{4}$ in. long. Stamens

short, not exserted; upper filaments hairy throughout, not appendiculate.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5472!

21. **O. usambarensis**, *Gürke in Engl. Pfl. Ost-Afr. C.* 349. A branched herb, with stems pubescent upwards. Leaves shortly petioled, ovate, 1-1½ in. long, acute, narrowed to the base, deeply inciso-crenate, membranous, pubescent on both surfaces. Whorls 6-flowered, forming a lax cylindrical raceme, 3-6 in. long; bracts minute, broadly ovate; pedicels pubescent, ⅙ in. long. Calyx finally ⅙ in. long; upper tooth ovate, with decurrent edges, as long as the tube; lateral teeth deltoid-cuspidate; lower subulate. Corolla-tube twice as long as the calyx; lips small. Stamens included.

Mozamb. Dist. German East Africa: Usambara; Masheua, *Holst*, 3561A!

22. **O. dissitifolius**, *Baker*. Perennial. Stems slender, erect, simple or branched, under a foot long, slightly hairy. Leaves in few distant pairs, shortly petioled, obovate-cuneate, obtuse, obscurely crenate, 1-1½ in. long, moderately firm, obscurely pubescent on both sides. Flowers in few whorls forming a lax terminal raceme, 6-8 in a whorl; pedicels hairy, ⅙-¼ in. long; bracts lanceolate, minute. Calyx purplish, ⅙ in. long, slightly hairy; tube campanulate; upper lip ovate, as long as the tube; lower teeth large, lanceolate, longer than the upper lip. Corolla-tube cylindrical, much longer than the calyx; lips small. Stamens not exserted.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, 5000-6000 ft., *Carson*, 69!

23. **O. malosanus**, *Baker*. A much-branched erect perennial, with stems woody in the lower part and slender densely pilose branches. Leaves shortly petioled, obovate-cuneate, very small, obtuse, crenate in the upper half, green and thinly pilose on both surfaces. Whorls 4-6-flowered, forming a short lax raceme; bracts minute; pedicels pubescent, ⅙ in. long. Fruit-calyx pilose, above ¼ in. long; tube campanulate; upper tooth ovate; lateral teeth lanceolate; lower linear, longer than the tube. Corolla as long as the calyx; lips small. Stamens not exserted.

Mozamb. Dist. British Central Africa: Nyusaland; Mount Malosa, 4000-6000 ft., *Whyte*!

24. **O. Wakefieldii**, *Baker*. Perennial. Stems slender, decumbent, much-branched, pubescent, 1-2 ft. long. Leaves small, petioled, orbicular, crenate, densely hairy on both sides. Racemes lax; bracts minute, deciduous; whorls few-flowered; pedicels as long as the calyx. Calyx ⅙ in. long; tube campanulate; upper tooth orbicular, as long as the tube; lateral teeth small; lower large cusps. Corolla-tube subcylindrical,

dilated at the throat, twice as long as the calyx; lobes small. Stamens not exserted.

Nile Land. British East Africa: collected in a journey from Ribe to the Galla country, *Wakefield!*

25. **O. Schimperii**, *Benth. in DC. Prod.* xii. 51. Perennial. Stems erect or decumbent, simple or branched, densely hairy upwards. Leaves petioled, ovate, crenate, 1–3 in. long, hairy on both sides. Racemes dense or lax; whorls many-flowered; bracts minute, deciduous; pedicels short, pubescent. Calyx pubescent, finally $\frac{1}{4}$ in. long; tube oblong; upper lobe suborbicular, much shorter than the tube; lateral teeth small cusps; lower large cusps. Corolla-tube rather longer than the calyx; lobes small. Stamens not exserted.—A. Rich. Tent. Fl. Abyss. ii. 180. *Ocimum coloratum*, Hochst. in Flora, 1841, Intell. 23; Engl. Hochgebirgsfl. Trop. Afr. 358.

Nile Land. Abyssinia: Tigre; among stones on the summit of Mount Scholoda, *Schimper*, 313! and without precise locality, *Petit!* British East Africa: Niamniam; Nganye, *Schweinfurth*, 3941!

26. **O. somalensis**, *Vatke in Linnæa*, xliii. 87. Perennial. Stem 3 ft. high, much-branched, slightly pubescent. Leaves distinctly petioled, ovate, acute, membranous, crenate, pubescent, $\frac{1}{2}$ –1 in. long. Whorls few-flowered, forming a lax terminal raceme; bracts minute; pedicels shorter than the calyx. Calyx finely pubescent, finally $\frac{1}{5}$ – $\frac{1}{4}$ in. long; tube oblong; upper tooth ovate, shorter than the tube; lateral and lower large, cuspidate from a deltoid base. Corolla-tube half as long again as the calyx; limb small. Stamens not exserted.

Nile Land. Somaliland: Serrut Mountains, near Maid, 4900 ft., *Hildebrandt*, 1428!

27. **O. Hildebrandtii**, *Baker*. An erect branched perennial, with subglabrous stems. Leaves distinctly petioled, membranous, ovate, obtuse, crenate, about 1 in. long. Whorls few-flowered, forming a lax terminal raceme; bracts minute; pedicels shorter than the calyx. Flower-calyx $\frac{1}{6}$ in. long; tube oblong, slightly pubescent; upper lip very small, obtuse; lateral teeth deltoid; lower larger, lanceolate-cuspidate. Corolla-tube subcylindrical, much longer than the calyx; lobes small. Stamens not exserted.—*O. australis*, *Vatke in Linnæa*, xliii. 86, not xl. 179.

Nile Land. British East Africa: Ukamba; Kitui, *Hildebrandt*, 2746!

28. **O. coloratus**, *Vatke in Linnæa*, xliii. 86. Perennial. Stem erect, pubescent, simple or branched, under 1 ft. long. Leaves petioled, ovate or oblong, crenate, pubescent, 1–1 $\frac{1}{2}$ in. long, cuneate and entire at the base. Racemes lax or moderately dense; bracts minute, deciduous; flowers 3–6 in a whorl; pedicels shorter than the calyx. Calyx very hairy, $\frac{1}{6}$ in. long; upper tooth oblong, shorter than the tube; lateral teeth small cusps; lower large cusps. Corolla-tube subcylindrical, half

as long again as the calyx; lips half as long as the tube. Stamens not exerted.

Nile Land. British East Africa: Ukamba; Kitui, *Hildebrandt*, 2747!

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, *Whyte*!

29. **O. Johnstonii**, *Baker*. Perennial, with a thick woody root-stock. Stems short, slender, tufted, erect, branched, obscurely pubescent. Leaves shortly petioled, small, oblong or oblong-lanceolate, obscurely toothed, moderately firm, pubescent on both sides. Whorls few-flowered, forming a lax terminal raceme; bracts minute; pedicels shorter than the calyx. Calyx finally $\frac{1}{3}$ in. long; tube oblong; upper tooth small, turning red; lateral teeth small cusps; lower larger cusps. Corolla-tube twice as long as the calyx; lobes small. Stamens not exerted.

Nile Land. British East Africa: Kilimanjaro Expedition, 40 to 60 miles from the coast, *Johnston*!

30. **O. nyasicus**, *Baker*. An erect branched herb, with slender stems densely clothed with soft spreading hairs. Leaves distinctly petioled, ovate, 2 in. long, acute, deeply crenate, broadly rounded at the base, deep green and nearly glabrous on both surfaces. Whorls few-flowered, forming a long lax raceme; bracts minute; pedicels short. Fruit-calyx pilose, $\frac{1}{6}$ in. long; tube campanulate; teeth much shorter than the tube; upper ovate; lower lanceolate. Corolla $\frac{1}{4}$ in. long; tube cylindrical, more than twice as long as the calyx; lips small. Stamens not exerted.

Mozamb. Dist. British Central Africa: Nyasaland; North Nyasa, *Whyte*!

31. **O. longipes**, *Baker*. An erect herb, with slender slightly pubescent stems 3 ft. long. Leaves ovate, acute, membranous, crenate, 2-3 in. long, nearly glabrous on both surfaces; petiole nearly as long as the blade. Whorls few-flowered, forming a long lax raceme; bracts minute; pedicels $\frac{1}{8}$ in. long. Calyx finally $\frac{1}{4}$ in. long; tube campanulate; upper tooth orbicular, purple, as long as the tube; lateral small cusps; lower large cusps. Corolla-tube cylindrical, curved, hairy, twice as long as the calyx; lobes small. Stamens not exerted.

Lower Guinea. Angola: thirty miles inland from Ambriz, *Monteiro*!

32. **O. australis**, *Vatke in Linnaea*, xl. 179. Habit of *Ocimum sanctum*. Probably annual. Stems much-branched, slightly pubescent towards the top. Leaves petioled, ovate, obtuse, dentate, subglabrous, the largest $1\frac{1}{2}$ in. long, 1 in. broad. Racemes slender, simple; whorls 6-flowered; bracts minute, shorter than the pedicels. Calyx $\frac{1}{5}$ in. long in flower, rather larger in fruit; upper tooth obovate, concave, pilose, decurrent; 4 lower teeth long, setaceous. Corolla more than twice the length of the calyx.

Mozamb. Dist. Portuguese East Africa: Rios de Sena, *Peters*.

33. **O. Cameroni**, *Baker in Kew Bulletin*, 1895, 72. Perennial; stems short, slender, erect, simple, finely pubescent. Leaves sessile, oblong-lanceolate, acute, minutely toothed, slightly pubescent, 1–1½ in. long. Whorls few, few-flowered, forming a very lax terminal raceme; bracts minute; pedicels very short, pubescent. Calyx ¼ in. long; tube campanulate, pubescent; upper tooth short, broad, obtuse; lateral and lower teeth minute cusps. Corolla-tube a little longer than the calyx; lower lip ¼ in. long. Stamens much exserted.

Mozamb. Dist. Lake Tanganyika, *Cameron!* British Central Africa: Urungu; Fwambo, 5200 ft., *Nutt! Carson!*

34. **O. iodocalyx**, *Briquet in Engl. Jahrb.* xix. 174. Suffruticose at the base; branches reddish, subglabrous. Leaves petioled, oblong, 1½–2½ in. long, acute or subacute, narrowed to the base, regularly and deeply crenate, glabrous on both surfaces, green above, glabrous beneath. Raceme 4 in. long, moderately dense; bracts deciduous; axis shortly pubescent; pedicels finally ⅙ in. long. Flower-calyx violet, ⅙–⅙ in. long; upper tooth ovate, scarcely decurrent; lower teeth setaceous. Corolla protruding ⅙ in. from the throat of the calyx; lower lip ⅙ in. long. Stamens exserted.

Lower Guinea. Angola: at the River Kuango, *Pogge*, 353.

35. **O. breviflorus**, *Vatke in Linnæa*, xliii. 88. Perennial. Stems slender, simple, densely pubescent. Leaves shortly petioled, cordate-ovate, acute, membranous, green and hairy on both sides, 1½–1 in. long. Whorls numerous, many-flowered, forming a moderately dense terminal raceme 3–4 in. long; bracts, except the lowest, small; pedicels shorter than the calyx. Calyx ⅙ in. long; tube campanulate; upper tooth obovate, longer than the tube; lower about as long, deltoid or lanceolate. Corolla but little longer than the calyx. Lower stamens exserted. Style not capitate, as described by *Vatke*.

Nile Land. British East Africa: Taita; Ndara Plain, *Hildebrandt*, 2414!

36. **O. linearis**, *Benth. in Hook. Ic. Pl. t.* 1274. Stems very slender, square, glabrous. Leaves sessile, narrow linear, glabrous, 1-nerved, 1 in. long; margins revolute. Raceme very long; whorls 2–6-flowered; bracts minute; pedicels shorter than the calyx. Calyx ⅙ in. long; tube campanulate; upper lip orbicular, shorter than the tube; lateral teeth deltoid, with a small cusp; lower small, subulate. Corolla-tube twice as long as the calyx, cylindrical, with a dilated throat. Stamens much exserted; anthers filaments connate above the middle.—*Rolfe in Oates, Matabeleland*, ed. 2, 407.

Mozamb. Dist. Matabeleland, *Oates!*

37. **O. liebrechtsianus**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 84. A perennial herb or undershrub, with ascending pubescent or subglabrous branches. Leaves shortly petioled, oblong-lanceolate, 1 in. long, obtuse, crenate, narrowed to the base, dark green above, light

green beneath, glabrescent or pilose. Raceme lax, 2–3 in. long; whorls 6-flowered; bracts small, lanceolate; pedicels short, pubescent. Calyx very variable in size, $\frac{1}{8}$ – $\frac{1}{3}$ in. long; tube campanulate, pilose; upper tooth ovate, lower subulate. Corolla white, protruding $\frac{1}{3}$ in. from the throat of the calyx; lips small. Stamens slightly exserted.—De Wild. & Durand, Ill. Fl. Congo, i. t. 37.

South Central. Congo Free State: Mossauze, *Descamps*; Mtowa, on Lake Tanganyika, *Descamps*.

38. **O. schinzianus**, *Briquet in Engl. Jahrb.* xix. 173. An erect annual, with a simple erect densely pubescent stem. Leaves subsessile, 2–3 in. long, acute, narrowed to the base, dentate, green and slightly pubescent above, grey and densely pubescent beneath. Raceme short, lax in the lower half; axis densely pubescent; upper bracts ovate, purple, persistent, very pubescent; pedicels $\frac{1}{8}$ in. long. Calyx densely pubescent, $\frac{1}{12}$ – $\frac{1}{8}$ in. long; upper tooth ovate, the others lanceolate. Corolla-tube as long as the calyx; lips small. Stamens distinctly exserted.

Lower Guinea. German South-West Africa: Amboland; Oshibeke, *Schinz*, 45!

Very near *O. bracteosus*, Baker.

39. **O. bracteosus**, *Baker*. Annual. Stems slender, branched, hairy, erect, 1–3 ft. long. Leaves lanceolate, serrate, 2–6 in. long, sessile or shortly petioled, hairy on both sides. Racemes long, lax; flowers 4–6 in a whorl; rhachis hairy; pedicels short; upper bract large, ovate, reddish, membranous, persistent. Calyx finally $\frac{1}{4}$ in. long; upper tooth orbicular, shorter than the tube; lower with large cusps. Corolla-tube half as long again as the calyx. Stamens much exserted.—*Ocimum bracteosum*, Benth. in DC. Prod. xii. 41; Hook. Ic. Pl. t. 455; Briquet in Bull. Herb. Boiss. ii. 122; Vatke in Linnæa, xl. 177; *Hemizygia bracteosa*, Briquet in Ann. Jard. Gen. ii. (1898) 248.

Upper Guinea. Senegal: sandy soil at Mahina, *Lecard*, 174. 219 (ex *Briquet*); and without precise locality, *Heudelot*, 396! Niger Territory: Nupe, common, *Barter*, 946!

Mozamb. Dist. German East Africa: Usambara; Duga, *Holst*, 3189! Portuguese East Africa: near Lupata, *Kirk*! Rios de Sena and Boros, and near Tete, *Peters* (ex *Vatke*). British Central Africa: Nyasaland; Namasi, *Cameron*, 18! Mount Malosa, 4000–6000 ft., *Whyte*! Shire Highlands, *Buchanan*, 74!

40. **O. Marquesii**, *Briquet in Ann. Jard. Gen.* ii. (1898) 242. An undershrub, with hairy, often violet branches. Leaves shortly petioled, round-ovate, 1 in. long, obtuse, pubescent and green on both surfaces, slightly rugose beneath, crenate. Whorls simple, 6-flowered, forming long racemes; pedicels shorter than the calyx; lower bracts deciduous; upper large, round-ovate, violet, forming a persistent coma. Flower-calyx $\frac{1}{3}$ – $\frac{1}{2}$ in. long, densely pilose at the base, glabrescent upwards; upper tooth small, ovate, lower teeth setaceous. Corolla violet, protruded $\frac{1}{3}$ in. from the throat of the calyx; tube shortly exserted. Stamens

protruded $\frac{1}{4}$ in. from the throat of the calyx. Style entire, clavate at the apex.

Lower Guinea. Angola : Malange, *Marques*, 25, 64.

Henriques, in *Bolet. Soc. Brot.* xvi. 70, reduces this to *O. Welwitschii*, Rolfe.

41. **O. Welwitschii**, *Rolfe in Bolet. Soc. Brot.* xi. 88. Perennial. Stems erect, finely pubescent, simple or branched, 1–1½ ft. long. Leaves oblong, 1–1½ in. long, shortly petioled, entire or obscurely serrate, pubescent on both sides. Racemes long, lax ; flowers about 4 in a whorl ; rhachis pubescent ; pedicels short, ascending ; upper bracts large, bright red, ovate, acute, persistent. Calyx finally $\frac{1}{3}$ in. long ; upper lip orbicular, shorter than the tube ; 4 lower teeth large cusps. Corolla-tube half as long again as the calyx ; lips small. Stamens exerted beyond the corolla-lips. — *C. adornatus*, Briquet in *Engl. Jahrb.* xix. 176.

Lower Guinea. Angola : province of Huilla, *Welwitsch*, 5519 ! 5520 ! 5555 ! Ambaca ; Lutete Savannah, *Buchner*, 570 ; Malange, *Marques*, 7 ! *Mechow*, 166 ; between Sanza and Malange, *Pogge*, 349 ; Quissange, *Archieta*, 41.

Briquet, l. c., describes 3 varieties, *chlorochrous*, *oblongifolius*, and *rotundifolius*.

42. **O. Kirkii**, *Baker*. Perennial. Stems finely pubescent, 1–2 ft. long, simple or branched. Leaves 2–4 to a node, lanceolate or oblong-lanceolate, 2–3 in. long, sessile or shortly petioled, entire or serrate, firm, obscurely pubescent on both sides. Racemes dense at the top, lax towards the base ; pedicels very short ; upper bracts large, linear, dark purple. Calyx finally $\frac{1}{4}$ in. long ; upper tooth orbicular ; lower teeth with large cusps. Corolla-tube twice as long as the calyx. Stamens much exerted.

Nile Land. British East Africa : Nyika country, near Mombasa, *Wakefield*.

Mozamb. Dist. Lake Tanganyika, *Cameron* ! Portuguese East Africa : between Unango and Mtonia, east of Lake Nyasa, *Johnson* ! British Central Africa : Nyasaland ; west shore of Lake Nyasa, at the foot of Kowirwi Hill, *Kirk* ! Mount Chiradzulu, *Meller* ! Manganji Hills, *Meller* ! Mount Malosa, 4000–6000 ft., *Whyte* ! Mount Zomba and vicinity, 2800–3500 ft., *Whyte* ! Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte* ! Mount Mlanji, *Whyte*.

43. **O. Elliottii**, *Baker*. Perennial, suffruticose. Stems slender, simple or branched, very hairy. Leaves small, ovate, or oblong, entire, nearly sessile, densely hairy on both sides. Raceme finally long and lax ; flowers 2 to a whorl ; rhachis densely hairy ; pedicels short ; upper bracts orbicular, persistent, bright red, $\frac{1}{4}$ in. diam. Calyx finally $\frac{1}{4}$ in. long ; upper tooth ovate, obtuse, much shorter than the tube ; lower teeth with large cusps. Corolla-tube a little longer than the calyx. Stamens not exerted beyond the corolla-lips.

Mozamb. Dist. Matabeleland, *Elliott* !

Imperfectly known species.

44. **O. grandiflorus**, *Terracciano in Bull. Soc. Bot. Ital.* 1892, 424. Leaves undulato-crispate, canescent at the base. Pedicels slender,

scarcely pubescent. Lower calyx-teeth long, setaceous. Corolla hairy, three times the length of the calyx.

Nile Land. Somaliland : Gerar Amaden, *Candeo & Baudi di Vesme*.

8. **HOSLUNDIA**, Vahl; Benth. et Hook. f. Gen. Plant. ii. 1174.

Calyx small in the flowering stage, with an oblong tube and 5 small teeth, in fruit much larger, berry-like, closed in at the throat. Corolla-tube straight, exserted; upper lip small; lower larger, concave. Perfect stamens 2, anticus, declinate; filaments free, filiform; anther-cells confluent; posticus stamens represented by two small staminodes. Disk glandular. Style shortly bifid at the apex. Nucules ovoid, punctate, included in the dilated calyx.

Monotypic. Also in South Africa and Madagascar.

1. **H. opposita**, Vahl; Benth. in DC. Prod. xii. 54. A much-branched, erect or sarmentose shrub, reaching a height of 10–15 ft., with slender glabrous or slightly pubescent branchlets. Leaves opposite, petioled, oblong or oblong-lanceolate, acute, crenate at the base, dentate, 3–4 in. long, glabrous above, slightly pubescent beneath. Inflorescence an ample lax deltoid terminal panicle; branchlets pubescent; bracts very small; pedicels as long as the flower-calyx. Flower-calyx pubescent, $\frac{1}{2}$ in. long; teeth deltoid. Corolla lilac, more than twice as long as the calyx. Fruit-calyx globose, red, edible.—P. Beauv. Fl. Owar. i. 52, t. 33; Cummins in Kew Bulletin, 1898, 77.

Upper Guinea. Gambia, *Skues!* Sierra Leone: in a wood near the Loma burn, *Scott-Elliot*, 5021! French Guinea: Farana, on the River Niger, *Scott-Elliot*, 5322! Gold Coast: Cape Coast Castle, *Vogel*, 4! Aquapim (Acropong) Mountains, *Thonning*. Ashanti: Assin-yan-Coomassie, *Cummins*, 144! Togoland: Alafanyo, *Krause!* Lagos: Abeokuta, *Rowland!* Lower Niger: Aboh, *Barter*, 298! Oware, *Beauvois*. Cameroons: Cameroon Mountain, 1000–2000 ft., *Mann*, 1252! Yaunde, 2500 ft., *Zenker & Staudt*, 83! Fernando Po, *Mann*, 264!

Lower Guinea. Portuguese Congo: Malemba, near Landana, *Phillips!* Angola: Ambriz, *Monteiro!*

Var. *verticillata*, Baker. Leaves ternate.—*H. verticillata*, Vahl; Benth. l. c.

Upper Guinea. Senegal, *Heudelot*, 41! Lagos, *Barter*, 3323! Niger Territory: Nupe, *Barter*, 1729!

Nile Land. British East Africa: Jur; Jur Ghattas, *Schweinfurth*, 1798!

Lower Guinea. Congo, *Smith!* *Dewèvre*, 942.

Var. *decumbens*, Baker. Stem and leaves more hairy than in the type, inflorescence less compound, flower-calyx larger with an oblong tube.—*H. decumbens*, Benth. in DC. Prod. xii. 54. *Orthosiphon physocalycinus*, A. Rich. Tent. Fl. Abyss. ii. 180.

Nile Land. Eritrea: Ginda, 3000 ft., *Schweinfurth & Riva*, 2200! Keren, 4500 ft., *Beccari*, 165! Abyssinia, *Schimper*, 96! *Quartin-Dillon & Petit!* British East Africa: Nuer district, by the Ghazal River, *Schweinfurth*, 1171! Uganda, *Wilson*, 93!

Lower Guinea. Angola, *Welwitsch*, 5672! 5673!

Mozamb. Dist. Zanzibar, *Bojer!* *Speke*, 8! German East Africa: Usambara; Nderema, *Holst*, 2240! Kilimanjaro, at Marangu, 4800 ft., *Volkens*, 757!

hills north-east of Lake Tanganyika, 5000–6000 ft., *Scott-Elliot*, 8233! Portuguese East Africa: bank of the River Luabo, *Kirk*, 18! Lower Zambesi; Shupanga, *Kirk*! Morambala Mountain, *Kirk*! Lower Shire Valley, *Kirk*! British Central Africa: Nyasaland; Manganja Hills, *Meller*! Zomba and east end of Lake Shirwa, *Meller*! Kondowe to Karonga, 2000–6000 ft., *Whyte*! Songwe River and Karonga, 1700–2000 ft., *Whyte*, 58! and without precise locality, *Buchanan*, 410! 916! Rhodesia; Tamasetze, *Holub*! Gashuma Plain, *Holub*, 1919! Leshuma Valley, *Holub*!

Also in South Africa and Madagascar.

9. **ALVESIA**, Welw.; Benth. et Hook. f. Gen. Plant. ii. 1176.

Calyx small in the flowering stage, with a campanulate tube and very small obtuse lobes, in fruit large, scariose and inflated. Corolla-tube scarcely longer than the calyx; throat dilated, oblique; upper lip very short; lower large, oblong, concave. Stamens 4, didynamous, declinate; filaments free; anther-cells confluent. Disk thick, equal, entire or shortly lobed. Style shortly bifid. Nucules obovoid, granular.

Endemic and monotypic.

1. **A. rosmarinifolia**, Welw. in *Trans. Linn. Soc.* xxviii. 55, t. 19. A much-branched undershrub, 3–4 ft. high, with woody branches and small square densely hairy branchlets. Leaves small, sessile, lanceolate, entire, rather rigid, with reflexed edges, very hairy. Whorls many-flowered, forming simple dense racemes; bracts small, ovate; pedicels $\frac{1}{8}$ – $\frac{1}{6}$ in. long, densely hairy, like the rhachis. Calyx in flower $\frac{1}{8}$ in. long, densely coated with whitish pubescence, in fruit ventricose, 1 in. long. Corolla pale lilac; tube $\frac{1}{4}$ in. long; lower lip decurved, as long as the tube. Stamens as long as the lower lip.—*Engl. Hochgebirgsfl. Trop. Afr.* 362; *De Wild. & Durand, Ill. Fl. Congo*, i. t. 42.

Lower Guinea. Lower Congo: Stanley Pool, 1000 ft., *Hens*, 88! Angola: province of Huilla, 3800–5500 ft., *Welwitsch*, 1636! Chella Mountains, *Johnston*! Cunene River, *Johnston*!

I think the plant mentioned in *Gen. Plant.* l. c., raised by Messrs. Rollison from seeds given them by Dr. Livingstone, is a form of the same species, I suppose either from the Mozambique or South Central districts.

10. **PYCNOSTACHYS**, Hook.; Benth. et Hook. f. Gen. Plant. ii. 1177.

Calyx slightly accrescent; tube short, campanulate; teeth 5, subequal, subulate, rigid. Corolla-tube longer than the calyx, deflexed and dilated at the throat; upper lip short, 4-toothed; lower longer, deeply concave. Stamens 4, didynamous, declinate; filaments filiform, free; anther-cells confluent. Disk subequal. Style shortly bifid. Nucules subglobose, smooth.—Perennial herbs. Leaves opposite, broad or narrow, sessile or petioled. Whorls condensed into a dense terminal spike; bracts small. Corolla bright blue or violet.

One additional species in Madagascar.

*Leaves sessile.

Leaves linear.

- Calyx-teeth not longer than the tube 1. *P. stenostachys*.
 Calyx-teeth finally twice the length of the tube 2. *P. Schweinfurthii*.
 Calyx-teeth three times the length of the tube 3. *P. Descampsii*
 Leaves linear-lanceolate 4. *P. Stuhlmannii*.

Leaves lanceolate.

Spikes cylindrical.

- Teeth of fruit-calyx erect 5. *P. congensis*.
 Teeth of fruit-calyx spreading 6. *P. micrantha*.

Spikes oblong or conical.

- Leaves very small, fasciated 7. *P. parvifolia*.

Leaves opposite, not very small.

- Leaves $1\frac{1}{2}$ –2 in. long, deflexed 8. *P. deflexifolia*.

Leaves middle-sized.

- Calyx-teeth $\frac{1}{8}$ – $\frac{1}{6}$ in. long 9. *P. Kirkii*.

- Calyx-teeth $\frac{1}{4}$ in. long 10. *P. remotifolia*.

Leaves large.

- Leaves amplexicaul 11. *P. speciosa*.

- Leaves not amplexicaul 12. *P. affinis*.

- Spikes globose 13. *P. sphærocephala*.

Leaves oblong-lanceolate.

Calyx-teeth $\frac{1}{6}$ – $\frac{1}{5}$ in. long.

- Veins of the lower surface of the leaf slightly raised 14. *P. reticulata*.

- Veins of the lower surface of the leaf much raised 15. *P. decussata*.

Calyx-teeth $\frac{1}{4}$ in. long.

- Leaves glabrous 16. *P. Peltherickii*.

- Leaves pubescent 17. *P. niamniamensis*

- Leaves oblong 18. *P. Whytei*.

- Leaves ovate 19. *P. nepetaefolia*.

**Leaves shortly petioled.

- Leaves linear or lanceolate 20. *P. verticillata*.

- Leaves oblong-lanceolate 21. *P. Volkensii*.

Leaves oblong.

- Leaves subentire 22. *P. Hanningtonii*.

- Leaves deeply serrate 23. *P. Meyeri*.

Leaves ovate.

- Calyx-teeth $\frac{1}{2}$ in. long 24. *P. ruwenzoriensis*.

- Calyx-teeth $\frac{1}{4}$ – $\frac{1}{3}$ in. long 25. *P. abyssinica*.

***Leaves with a long petiole.

- Leaves lanceolate 26. *P. Goetzenii*.

- Leaves oblong-lanceolate 27. *P. Emini*.

- Leaves oblong 28. *P. oblongifolia*.

Leaves ovate-lanceolate.

- Leaves glabrous 29. *P. orthodonta*.

- Leaves pubescent 30. *P. pubescens*.

Leaves ovate.

Leaves glabrous.

- Calyx-teeth subulate 31. *P. leptophylla*.

- Calyx-teeth lanceolate-subulate 32. *P. Balesii*.

- Leaves pubescent on the ribs and edges 33. *P. cyanea*.

- Leaves densely pubescent 34. *P. urticifolia*.

1. **P. stenostachys**, *Baker*. A perennial, with branched square glabrous stems. Leaves distant, linear, sessile, glabrous. Spikes very dense, cylindrical, 2–2½ in. long, under ½ in. diam. exclusive of the corollas. Fruit-calyx ⅛ in. long; teeth linear, not longer than the campanulate tube. Corolla not seen.

Nile Land. Unyoro: banks of the Nile, amongst rushes, *Speke & Grant!*

2. **P. Schweinfurthii**, *Briquet in Engl. Jahrb.* xix. 191. An erect branched perennial, with pale square stems 2 ft. long, pubescent towards the top. Leaves distant, linear, spreading, sessile or subsessile, serrate, obscurely pubescent beneath, the largest 3–4 in. long, ¼ in. broad at the middle. Spikes very dense, finally 1½–2 in. long, ¾–1 in. diam. exclusive of the corollas. Fruit-calyx ¼–⅓ in. long; teeth subulate, twice as long as the campanulate tube. Corolla pale blue, glabrous outside; lower lip ¼ in. long.

Upper Guinea. Togoland: Krakye, *Krause!*

Nile Land. British East Africa: Bongo; Dukuttu (Duggudu), *Schweinfurth*, 2770!

3. **P. Descampsii**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 63. A tall herb. Stem cylindrical, many-ribbed, pubescent; internodes long. Leaves 5–6 in a whorl, subsessile, linear, 1–2½ in. long, very acute, narrowed to the base, obscurely toothed, green and pubescent on both surfaces. Spike dense, terminal, oblong-conical, 1–1½ in. long; bracts linear, as long as the expanded flowers, protruding beyond the buds. Tube of flower-calyx campanulate, very small, densely pubescent; teeth subulate, ⅓–½ in. long. Corolla blue, protruding ⅓–½ in. from the throat of the calyx; lips ⅓–½ in. long. Stamens included.

South Central. Congo Free State: Risobi, near the River Lufongo, *Descamps*.

4. **P. Stuhlmannii**, *Gürke in Engl. Pfl. Ost-Afr. C.* 345. Stems tetragonous, branched, pubescent. Leaves very shortly petioled, linear-lanceolate, conspicuously acuminate, narrowed to the base, deeply serrate, glabrous on the upper surface except on the ribs, pubescent beneath. Spikes short, ovoid. Calyx pubescent; teeth rather longer than the tube, pubescent upwards.

Nile Land. German East Africa: Karagwe; Ngaramo district, *Stuhlmann*, 1630.

5. **P. congensis**, *Gürke in Bull. Herb. Boiss.* iv. 819. Stem and branches pubescent. Leaves sessile, lanceolate, acuminate, 2–4 in. long, strongly serrate, glabrous on both surfaces or pubescent on the main veins. Spike cylindrical. Calyx-tube campanulate, glandular-pubescent, ½ in. long; teeth erect, as long as the tube.

South Central. Congo Free State: Samba, *Descamps*, 28; Lusambo, on the River Sankuru, *Descamps*, 27.

6. **P. micrantha**, *Gürke in Engl. Pfl. Ost-Afr. C.* 345. Stems tetragonous, pubescent, branched. Leaves sessile or very shortly petioled, lanceolate, narrowed to the base, very acuminate, serrate, quite glabrous on both surfaces. Spikes narrow, cylindrical. Calyx campanulate, glabrous; teeth divaricate, rigid, scarcely longer than the tube. Corolla small.

Mozamb. Dist. German East Africa: Karagwe, *Stuhlmann*, 1720; Bukoba, *Stuhlmann*, 3276, 3718, 3953; Mpororo, *Stuhlmann*, 2056.

7. **P. parvifolia**, *Baker in Kew Bulletin*, 1895, 72. Stems herbaceous, perennial, branched, densely pubescent, $1\frac{1}{2}$ –2 ft. long. Leaves sessile, verticillate, linear or lanceolate, entire, densely pubescent, unequal, the longest 6–9 lin. long. Racemes very dense, oblong or subglobose; bracts small, linear. Calyx pilose; tube very short; teeth rigid, linear-subulate, finally $\frac{1}{8}$ in. long. Corolla 6–9 lin. long; tube much longer than the calyx; upper lip small, narrow. Stamens included.

Mozamb. Dist. German East Africa: between Lake Tanganyika and Lake Rukwa, *Nutt!* British Central Africa: Urungu; Fwambo, 5000–6000 ft., *Carson*, 26! 34! 92! 103! Nyasaland; Tanganyika Plateau at Fort Hill, 3500–4000 ft., *Whyte!*

8. **P. deflexifolia**, *Baker*. A perennial herb, with quadrangular pubescent stems. Leaves in distant pairs, sessile, deflexed, lanceolate, $1\frac{1}{2}$ –2 in. long, acuminate, finely serrate, subcoriaceous, green and finely pubescent on both surfaces. Spikes dense, oblong, single, terminal, $1\frac{1}{2}$ –2 in. long. Calyx-tube small, campanulate, thinly pilose; teeth subulate, spreading, hispid, $\frac{1}{8}$ in. long. Corolla violet.

Nile Land. British East Africa: near Lake Elmeteita, 6000 ft., *Scott-Elliot*, 6756!

9. **P. Kirkii**, *Baker*. A perennial, with erect simple pubescent stems 2 ft. long. Leaves sessile, lanceolate, firm in texture, pubescent, distantly and minutely dentate, the lower 2–3 in. long, $\frac{1}{2}$ in. broad, the upper growing gradually smaller. Flower-spikes very dense, short, conical, paniced. Calyx-teeth in the flowering stage $\frac{1}{8}$ in. long. Corolla very hairy outside; lower lip $\frac{1}{4}$ in. long.

Mozamb. Dist. British Central Africa: Nyasaland; Manganja Hills, 3000–4000 ft., *Kirk!* and without precise locality, *Buchanan*, 700!

10. **P. remotifolia**, *Baker in Kew Bulletin*, 1898, 161. An erect perennial herb, with glabrous tetragonous stems. Leaves in a few distant pairs, sessile, lanceolate, 3–4 in. long, acuminate, narrowed to the base, toothed, green and glabrous on both surfaces. Spikes many, dense, oblong, paniced, $\frac{1}{2}$ – $1\frac{1}{2}$ in. long; lower flowers deflexed. Calyx-tube short; teeth setaceous, rigid, $\frac{1}{4}$ in. long. Corolla blue; tube longer than the calyx; lower lip concave, $\frac{1}{3}$ in. long. Stamens not exerted from the lower lip.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte!*

11. **P. speciosa**, *Gürke in Engl. Pfl. Ost-Afr. C.* 345. Stem tetragonous, pubescent, branched. Leaves sessile, lanceolate, the lower 4–5 in. long, 1–1½ in. broad, the upper shorter, narrower, amplexicaul, very acuminate, serrate, pubescent on both surfaces. Spikes oblong; bracts linear, reflexed, villous. Calyx campanulate; teeth longer than the tube, villous at the base. Corolla large, blue.

Mozamb. Dist. German East Africa: Masai Highlands, *Fischer*, 510. East shore of the Victoria Nyanza, *Fischer*, 499; in forest on the banks of the Ugalla River, *Böhm*, 117.

12. **P. affinis**, *Gürke in Engl. Pfl. Ost-Afr. C.* 345. Stem tetragonous, pubescent, branched. Leaves sessile, lanceolate, 6–8 in. long, narrowed to the base, very acuminate, serrate, pubescent on both surfaces. Spike oblong; bracts lanceolate, erect, villous. Calyx villous; teeth longer than the tube. Corolla large.

Mozamb. Dist. German East Africa: Mwanza, on the Victoria Nyanza, *Stuhlmann*, 4693.

13. **P. sphærocephala**, *Baker in Kew Bulletin*, 1898, 162. An erect perennial herb, with slender branched pubescent stems. Leaves few, distant, subsessile, lanceolate, ½–1 in. long, slightly toothed in the upper half, thick, subcoriaceous, pubescent on both surfaces. Heads small, globose; bracts small, linear, rigid. Calyx-tube campanulate, pubescent, ⅓ in. long; teeth linear-subulate, rigid, as long as the tube. Corolla not seen.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte*, 139!

14. **P. reticulata**, *Benth. in DC. Prod.* xii. 83. A perennial herb, with erect simple or branched obscurely pubescent stems 2–3 ft. long. Leaves sessile, oblong or oblong-lanceolate or lanceolate, firm in texture, crenate, strongly veined and slightly pubescent beneath, the lower 3–4 in. long, the upper growing gradually shorter. Spikes very dense, 1–2 in. long, ¾–1 in. diam. exclusive of the corollas. Calyx-teeth finally ⅓ in. long, thrice as long as the tube. Corolla hairy outside; lower lip ⅓ in. long. Stamens not exerted.—*Oliv. in Trans. Linn. Soc.* xxix. 138.

Nile Land. British East Africa: Unyoro; in moist dips of the ground in the Ukidi country, *Speke & Grant*!

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau, *Carson*!

15. **P. decussata**, *Baker*. A perennial herb, with quadrangular finely pubescent stems. Leaves decussate in sessile pairs, ascending, oblong-lanceolate, acute, 2 in. long, narrowed to the base, obscurely crenate, rigidly coriaceous, obscurely pubescent above, more pubescent with strongly raised veins beneath. Spikes very dense, oblong, single, terminal, 1½–2 in. long; flowers all deflexed. Calyx-tube small, cam-

panulate, densely pilose; teeth subulate, rigid, pilose, $\frac{1}{8}$ – $\frac{1}{3}$ in. long. Corolla not seen.

Nile Land. British East Africa: Kavirondo, in marshy places, *Scott-Elliott*, 7155!

16. **P. Petherickii**, *Baker*. A perennial, with obscurely pubescent square stems. Leaves sessile, erecto-patent, oblong-lanceolate, firm in texture, strongly ribbed beneath, crenate in the upper half, entire, in the lower half, 3–4 in. long, 1–1 $\frac{1}{4}$ in. broad at the middle, glabrous on both surfaces, copiously gland-dotted beneath. Spike very dense, finally 3–4 in. long, 1 $\frac{1}{4}$ in. diam. exclusive of the corollas. Calyx-teeth subulate, finally $\frac{1}{4}$ in. long, three times the length of the campanulate tube. Corolla pubescent on the outside.

Nile Land. White Nile, *Petherick*!

17. **P. niamniamensis**, *Gürke in Engl. Jahrb.* xxii. 145. Stem erect, pubescent. Leaves sessile or very shortly petioled, oblong-lanceolate, 2–3 in. long, about 1 in. broad, acute, narrowed to the base, sharply serrate, coriaceous, pubescent on both surfaces, with scattered red glands; veins raised beneath. Spikes oblong; bracts linear, pubescent, $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Calyx pubescent, $\frac{1}{3}$ – $\frac{1}{2}$ in. long; teeth erect, four times the length of the campanulate tube.

Nile Land. Niamniam: in swampy lowlands east of the River Huuh (Hoo), *Schweinfurth*, 3750A.

18. **P. Whytei**, *Baker*. An erect perennial herb, with branched finely pubescent dark brown stems. Leaves subsessile, oblong or oblong-lanceolate, 2–4 in. long, acute, crenate, moderately firm, green and slightly pubescent above, more densely pubescent beneath. Heads oblong, 1 $\frac{1}{4}$ in. diam. Calyx-tube campanulate, pubescent, $\frac{1}{8}$ in. long; teeth subulate, rigid, pungent, glabrous, finally twice as long as the tube. Corolla half as long again as the calyx. Stamens not exerted beyond the corolla-lips.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau at Fort Hill, 3500–4000 ft., *Whyte*!

19. **P. nepetæfolia**, *Baker*. A perennial herb, with quadrangular sulcate densely pubescent stems. Leaves sessile, ovate, 1–1 $\frac{1}{2}$ in. long, acute, rounded at the base, firm, obscurely pubescent above, densely pubescent with raised veins beneath. Spikes many, paniced, short, dense, conical; bracts large, lanceolate. Calyx-tube small, campanulate; teeth rigid, subulate, $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Corolla bright violet.

Nile Land. British East Africa: Kavirondo; in open grassy places on the Nandi Range, 7000–8000 ft., *Scott-Elliott*, 6471!

20. **P. verticillata**, *Baker in Kew Bulletin*, 1895, 71. Stem herbaceous, branched, pubescent, 2–3 ft. long. Leaves shortly petioled, verticillate, unequal, linear or lanceolate, 6–9 lin. long, 1–4 lin. broad, dentate, pubescent and green on both surfaces. Racemes dense, cylin-

dricul, $\frac{1}{2}$ in. diam.; bracts small, ovate. Calyx pilose; tube very short; teeth very rigid, linear, $\frac{3}{4}$ –1 lin. long. Corolla $\frac{1}{4}$ in. long; tube rather longer than the calyx; lips small. Stamens shorter than the corolla.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, 5000–6000 ft., *Carson*, 38!

21. **P. Volkensii**, *Gürke in Engl. Pfl. Ost-Afr. C.* 344. Stem branched, tetragonous, pubescent. Leaves shortly petioled, oblong-lanceolate, acuminate, narrowed to the base, serrate, pubescent on both sides. Flowers sessile, many in a spike. Calyx campanulate; teeth very rigid, $\frac{1}{6}$ in. long, reflexed, rather longer than the tube. Corolla violet.—*Gürke in Engl. Jahrb.* xxii. 144.

Upper Guinea. Cameroons: Cameroon Mountain, 6000–10,000 ft., *Mann*, 1222! 1960! *Johnston*, 37! *Preuss*, 688. Fernando Po: Clarence Peak, 9000 ft., *Mann*, 280!

Nile Land. British East Africa: Western slope of Ruwenzori, 5000–6000 ft., *Stuhlmann*, 2300.

Mozamb. Dist. German East Africa: Usambara; Mlalo, *Holst*, 3707, 3812; Kilimanjaro, Mawenzi Peak, 6600 ft., *Volkens*, 823. Ukami; Uluguru, 6000 ft., *Stuhlmann*, 9225.

22. **P. Hanningtonii**, *Baker*. Branchlets slender, square, glabrous. Leaves shortly petioled, oblong, acuminate, membranous, obscurely pubescent, slightly crenate, cuneate at the base, the upper 2–3 in. long. Flower-spike very dense, conical, $\frac{3}{4}$ in. diam., exclusive of the corollas. Calyx-teeth very slender, $\frac{1}{8}$ in. long in the flowering stage. Corolla with a large deflexed funnel-shaped throat, a small quadrate reflexed upper lip and a deeply concave lower lip, $\frac{1}{3}$ in. long. Stamens rather shorter than the lower lip.

Mozamb. Dist. German East Africa: Forests of Ugogo, *Hannington*!

23. **P. Meyeri**, *Gürke in Engl. Hochgebirgsfl. Trop. Afr.* 362. Stem branched, tetragonous, quite glabrous. Leaves shortly petioled, oblong, acuminate, serrate, 3–4 in. long, quite glabrous on both sides, narrowed to the base. Spike $1\frac{1}{2}$ – $2\frac{1}{2}$ in. long. Flower-calyx sessile; tube campanulate, $\frac{1}{2}$ lin. long; teeth 3–4 times the length of the tube. Fruit-calyx curved, $\frac{1}{4}$ in. long; teeth as long as the tube. Corolla half as long again as the flower-calyx.

Mozamb. Dist. German East Africa: Kilimanjaro, 6000–7000 ft., *Meyer*, *Volkens*, 1293!

24. **P. ruwenzoriensis**, *Baker*. A perennial herb, with strongly quadrangular pilose branches. Leaves shortly petioled, ovate, 2–3 in. long, acute or acuminate, deeply crenate, moderately firm, densely pubescent on both surfaces. Raceme solitary, very dense, terminal, oblong-cylindrical. Calyx-tube small, campanulate, densely pilose; teeth subulate, rigid, $\frac{1}{2}$ in. long. Corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long; tube much

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longer than the calyx, deflexed at the middle; lower lip round-navicular, $\frac{1}{8}$ in. long. Stamens reaching to the tip of the lower lip.

Nile Land. British East Africa: Ruwenzori, on granite, 5000 ft., *Scott-Elliot*, 7621!

25. **P. abyssinica**, *Fresen.*; *Benth. in DC. Prod.* xii. 83. A shrub, with stout woody main branches; branchlets finely pubescent. Leaves shortly petioled, ovate, acute, crenate, pubescent on both sides, the lower 3-4 in. long and broad. Spikes very dense, reaching a length of 3 in. and a diameter of $1\frac{1}{4}$ in. exclusive of the corollas. Calyx-tube campanulate, finally $\frac{1}{6}$ in. long; teeth very rigid, pubescent, $\frac{1}{4}$ - $\frac{1}{3}$ in. long. Corolla glabrous outside; lower lip $\frac{1}{4}$ in. long. Stamens as long as the lower lip.—*Vatke in Linnæa*, xxxvii. 324; *Engl. Hochgebirgsfl. Trop. Afr.* 363 partly; *Gürke in Engl. Jahrb.* xxii. 144.

Nile Land. Abyssinia: on the banks of streams near Gonda, *Schimper*, 1351!

26. **P. Goetzenii**, *Gürke in Götzen, Durch Afrika von Ost nach West, Sonderabdr.* 8. A shrub. Branches tetragonous, pubescent. Leaves distinctly petioled, lanceolate, 4-4 $\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. broad at the middle, acuminate, narrowed to the base, crenate, glabrous on both surfaces. Spikes dense, cylindrical, 2-3 in. long; bracts linear-lanceolate, ciliate, $\frac{1}{4}$ in. long. Calyx-tube globose, pubescent; teeth suberect, $\frac{1}{8}$ - $\frac{1}{5}$ in. long, 2-3 times the length of the tube. Corolla small.

South Central. Congo Free State: Kirunga Volcano, north of Lake Kivu, in forest, 7500-8000 ft., *Götzen*, 98.

27. **P. Emini**, *Gürke in Engl. Jahrb.* xxii. 145. A shrub, with pubescent branches. Leaves distinctly petioled, oblong-lanceolate, 3-4 in. long, 1-1 $\frac{1}{2}$ in. broad, acuminate, narrowed to the base, deeply crenate. pubescent above, deeply canescent below. Spikes ovoid-cylindrical; bracts linear, shorter than the calyx. Calyx-tube tubuloso-campanulate, pubescent, $\frac{1}{8}$ - $\frac{1}{5}$ in. long; teeth as long as the tube; intermediate appendages membranous, ovate.

South Central. Congo Free State: West Mpororo; Kayonza, 4500-5200 ft., *Stuhlmann*, 3070.

Mozamb. Dist. German East Africa: Karagwe; Bukoba, *Stuhlmann*, 3734, Kanesse, west of the Victoria Nyanza, *Stuhlmann*, 943.

28. **P. oblongifolia**, *Baker.* An undershrub, with strongly quadrangular green glabrous branches. Leaves distinctly petioled, oblong, 4-6 in. long, 2-3 in. broad at the middle, acute, narrowed to the base, deeply crenate, membranous, green and glabrous on both surfaces. Spike short, very dense, paniced. Calyx-tube campanulate; teeth subulate, rigid, pilose, $\frac{1}{8}$ - $\frac{1}{6}$ in. long. Corolla longer than the calyx; tube abruptly deflexed at the middle; lower lip oblong-navicular, $\frac{1}{8}$ in. long. Stamens included.

Nile Land. British East Africa: Toru district; in Wimi Valley, *Scott-Elliot*, 7883!

Mozamb. Dist. British Central Africa: Nyasaland; Masuka Plateau, 6500-7000 ft., *Whyte!* North Nyasa, *Whyte!*

29. **P. orthodonta**, *Gürke in Engl. Pfl. Ost-Afr. C.* 345. Stem tetragonous, glabrous. Leaves with a very long petiole, ovate-lanceolate, conspicuously acuminate, narrowed to the base, deeply crenate, membranous, quite glabrous on both surfaces. Spikes very long. Calyx-tube campanulate; teeth longer than the tube, straight, not reflexed.

Mozamb. Dist. Portuguese East Africa: Gorongoza; near Gouveia, *Carvalho*.

30. **P. pubescens**, *Gürke in Engl. Pfl. Ost-Afr. C.* 345. Stem branched, tetragonous, pubescent. Leaves with a long petiole, ovate-lanceolate, 3–4 in. long, acuminate, narrowed to the base, inciso-crenate, pubescent on both sides, more densely beneath. Spike elliptical; flowers sessile. Calyx globose, pubescent; teeth $1\frac{1}{2}$ –2 times the length of the tube, pubescent upwards.

Mozamb. Dist. Portuguese East Africa: Gorongoza district, *Carvalho*. British Central Africa: Nyasaland, *Buchanan*.

31. **P. leptophylla**, *Baker in Kew Bulletin*, 1898, 161. Stems long, erect, branched, square, obscurely pubescent. Leaves distinctly petioled, ovate, acute, membranous, scabrous, the lower 2 in. long; base entire, broadly cuneate. Spikes dense, 1–2 in. long. Calyx-tube campanulate, $\frac{1}{8}$ in. long; teeth subulate, scabrous, half as long again as the tube. Corolla blue, $\frac{1}{2}$ in. long; lower lip concave, unguiculate, $\frac{1}{8}$ in. long; upper lip small. Stamens not exerted.

Mozamb. Dist. British Central Africa: Nyasaland; Kondowe to Karonga, 2000–6000 ft., *Whyte!* and without precise locality, *Buchanan*, 873!

32. **P. Batesii**, *Baker*. An undershrub 8 ft. high, with slender quadrangular branches. Leaves long-petioled, cordate-ovate, 2–3 in. long, acute, crenate, membranous, green and glabrous on both surfaces. Spike terminal, very dense, 1 in. long. Calyx-tube campanulate, hairy; teeth lanceolate-subulate, rigid, erecto-patent, $\frac{1}{8}$ in. long. Corolla purple; lower lip oblong-navicular, $\frac{1}{8}$ in. long. Stamens included.

Upper Guinea. Cameroons: Efulen, in wet places, *Bates*, 372!

33. **P. cyanea**, *Gürke in Engl. Pfl. Ost-Afr. C.* 345. Stem branched, tetragonous, glabrous. Leaves with a long petiole, ovate, very acuminate, narrowed to the base, irregularly and deeply crenate, membranous, glabrous except on the ribs and margins. Spikes many-flowered. Calyx pubescent; tube campanulate, 10-nerved; teeth obliquely erect or slightly reflexed. Corolla blue.

Mozamb. Dist. German East Africa: Usagara; Tubugwe, *Stuhlmann*, 213. British Central Africa: Nyasaland, *Buchanan*.

34. **P. urticifolia**, *Hook. in Bot. Mag. t.* 5365. A much-branched perennial herb, 5–7 ft. high, with pubescent branchlets. Leaves long-petioled, ovate, acute, deeply inciso-crenate, densely pubescent, the lower 3–4 in. long. Spikes very dense, finally 2–3 in. long, $1\frac{1}{2}$ in. diam. exclusive of the corollas. Calyx finally $\frac{1}{2}$ in. long; teeth very rigid, three times as long as the tube. Corolla bright blue; lower lip

$\frac{1}{3}$ in. long. Stamens not longer than the lower lip.—Gürke in Engl. Jahrb. xxii. 146.

Nile Land. British East Africa : Ruwenzori, *Scott-Elliott*, 7719!

Mozamb. Dist. Portuguese East Africa: Mountains east of Lake Nyasa, *Johnson*! British Central Africa: Nyasaland; Mount Zomba, cultivated specimen, *Livingston*! Blantyre, *Buchanan*, 152! 207! Mbame Hill, 3000 ft., *Kirk*! *Meller*! Mount Chiradzulu, 4000 ft., *Whyte*! and without precise locality, *Buchanan*, 296! 586!

Originally described from a plant raised by Messrs. Backhouse, of York, from seeds given them by Dr. Livingstone from Mount Zomba.

Also in Natal.

11. **ICOMUM**, Hua in Bull. Mus. Hist. Nat. Par. 1897, 329.

Calyx campanulate or tubular, finally circumscissile above the base; upper lip 3-toothed; lower longer, 2-toothed. Corolla-tube more or less exserted from the calyx, slightly curved; throat oblique; upper lip erect; lower longer, concave. Stamens 4, didynamous, exserted; filaments free, naked; anther-cells confluent. Disk produced on the lower side of the ovary into a tongue-shaped process. Style bifid at the apex. Nucules ovoid, smooth.—Habit of *Eolanthus*, from which it differs by its alternate leaves.

Endemic.

- | | |
|--|-----------------------------|
| Corolla-tube hardly enlarged upwards; lower lip of corolla shallowly saccate | 1. <i>I. paradoxum</i> . |
| Corolla-tube inflated upwards; lower lip of corolla deeply saccate. | |
| Subcaulescent, with large lower leaves and few small cauline leaves | 2. <i>I. subacaule</i> . |
| Stem with many cauline leaves. | |
| Spike simple | 3. <i>I. lineare</i> . |
| Spike branched | 4. <i>I. salicifolium</i> . |

1. ***I. paradoxum***, Hua in Bull. Mus. Hist. Nat. Par. 1897, 329. Rootstock a large oblong tuber. Stem slender, erect, simple, 4–6 in. long. Leaves alternate, sessile, linear, erecto-patent, entire, under 1 in. long. Spikes short, dense, forming a small terminal panicle; bracts larger, linear. Calyx campanulate, pubescent; teeth minute. Corolla-tube cylindrical, pubescent, 4–5 times the length of the calyx; lips small, the lower linear, shallowly saccate. Stamens nearly as long as the lower lip.

Upper Guinea. French Soudan: Fouta-Jallon; near Timbo, *Miquel*, 43.

Described from a sketch kindly sent by M. Hua.

2. ***I. subacaule***, *Burkill* in Journ. Linn. Soc. xxxiv. 271, t. 6, figs. 5 and 6. A tufted perennial, with stems 5–6 in. long. Radical leaves many, sessile, oblong, obtuse, 3–4 in. long, narrowed gradually to the base, entire, green and glabrous on both surfaces; stem-leaves few, small, bract-like. Flowers in a simple moderately dense spike; bracts linear, persistent, foliaceous. Calyx campanulate, $\frac{1}{2}$ lin. long; throat

truncate. Corolla pubescent, $\frac{1}{3}$ in. long; tube dilated in the upper half; upper lip small, recurved; lower small, oblong, concave. Stamens included.—*Plectranthus ? subacaulis*, Baker in Kew Bulletin, 1895, 73.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, south of Lake Tanganyika, *Carson*, 33! 65!

3. **I. lineare**, *Burkill in Journ. Linn. Soc.* xxxiv. 270, t. 6, figs. 3 and 4. Perennial. Stem slender, erect, wiry, pubescent, 6–8 in. long, leafy from near the base to the apex. Leaves alternate, sessile, narrowly linear with slightly revolute edges, moderately firm, entire, glabrous, $\frac{1}{4}$ – $\frac{1}{2}$ in. long. Spike short, simple, terminal, moderately dense; bracts like reduced leaves. Calyx campanulate, $\frac{1}{2}$ lin. long, densely pubescent, truncate. Corolla $\frac{1}{3}$ in. long; tube longer than the lips, curved, dilated in the upper half; upper lip small, erect; lower larger, deeply concave. Stamens nearly as long as the upper lip; anthers globose, very small.

Mozamb. Dist. British Central Africa: North Nyasaland, near Fort Young, *Nicholson*!

4. **I. salicifolium**, *Burkill in Journ. Linn. Soc.* xxxiv. 270, t. 6, figs. 1 and 2. A perennial herb. Stems short, slender, decumbent, terete, densely pubescent. Leaves sessile, linear, 1–1 $\frac{1}{2}$ in. long, entire, subcoriaceous, glabrous or slightly pubescent. Spikes dense, 1–3 in. long, forming a dense terminal panicle; bracts linear, as long as the calyx. Calyx pubescent, cylindrical, $\frac{1}{6}$ in. long; lips very short. Corolla-tube as long as the calyx; lips small; upper oblong; lower orbicular. Stamens included in the lower lip. —*Eolanthus salicifolius*, Baker in Kew Bulletin, 1898, 161.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte*, 107!

12. **ÆOLANTHUS**, Mart.; Benth. et Hook. f. *Gen. Plant.* ii. 1176.

Calyx very small, campanulate, truncate at the throat or obscurely bilabiate, finally circumscissile near the base. Corolla-tube much longer than the calyx, subcylindrical or narrowly funnel-shaped; limb bilabiate; upper lip rather shorter, 4-lobed; lower rather longer, oblong or obovate, not deeply concave. Stamens 4, didynamous, declinate; filaments free; anther-cells confluent. Disk glandular. Style shortly bifid. Nucules compressed, smooth.—Annual or perennial herbs or small shrubs. Leaves various in shape and texture, sessile or petioled. Cymes paniced, condensed or elongated; bracts persistent, small or larger, foliaceous, imbricate. Corolla small, lilac.

Four additional species at the Cape, and one of which the native country is not known.

CRYPTANTHI.—Cymes not capitate. Bracts large, almost hiding the flowers.

Leaves sessile.

Annuals.

Leaves linear, entire.

Bracts $\frac{1}{6}$ in. long 1. *Æ. ambustus*.

- | | |
|---|--------------------------------|
| Bracts $\frac{1}{4}$ in. long | 2. <i>Æ. virgatus.</i> |
| Leaves lanceolate or oblong, pinnatifid | 3. <i>Æ. pinnatifidus.</i> |
| Leaves lanceolate, entire | 4. <i>Æ. prittwitzianus.</i> |
| Perennials. | |
| Leaves entire | 5. <i>Æ. abyssinicus.</i> |
| Leaves deeply lobed | 6. <i>Æ. Stuhlmanni.</i> |
| Leaves shortly petioled. | |
| Leaves oblong-lanceolate | 7. <i>Æ. Holstii.</i> |
| Leaves ovate-lanceolate | 8. <i>Æ. ukamensis.</i> |
| Leaves ovate-oblong | |
| Annual | 9. <i>Æ. rivularis.</i> |
| Perennial | 10. <i>Æ. Candelabrum.</i> |
| Leaves suborbicular | 11. <i>Æ. nyikensis.</i> |
| Leaves distinctly petioled. | |
| Leaves rhomboid-oblong | 12. <i>Æ. cuneifolius.</i> |
| Leaves ovate-oblong | 13. <i>Æ. buchnerianus.</i> |
| Leaves ovate. | |
| Bracts lanceolate | 14. <i>Æ. fruticosus.</i> |
| Bracts oblong-lanceolate | 15. <i>Æ. elsholtzioides.</i> |
| Bracts ovate-lanceolate | 16. <i>Æ. panganensis.</i> |
| Bracts broadly ovate | 17. <i>Æ. Njassæ.</i> |
| Leaves obovate-spathulate | 18. <i>Æ. Stormsii.</i> |
| ***PHANERANTHI.—Cymes not capitate. Bracts minute. | |
| Annuals. | |
| Leaves sessile | 19. <i>Æ. heliotropioides.</i> |
| Leaves petioled. | |
| Branches of panicle simple, long | 20. <i>Æ. elongatus.</i> |
| Branches of panicle compound. | |
| Leaves entire or obscurely toothed | 21. <i>Æ. pubescens.</i> |
| Leaves deeply toothed | 22. <i>Æ. Cameronii.</i> |
| Perennials. | |
| Leaves sessile or subsessile. | |
| Calyx very small, truncate. | |
| Bracts lanceolate | 23. <i>Æ. tuberosus.</i> |
| Bracts oblong | 24. <i>Æ. repens.</i> |
| Calyx $\frac{1}{2}$ in. long. | |
| Bracts lanceolate | 25. <i>Æ. serpiculoides.</i> |
| Bracts oblong | 26. <i>Æ. sedoides.</i> |
| Calyx $\frac{1}{8}$ in. long | 27. <i>Æ. nodosus.</i> |
| Leaves distinctly petioled. | |
| Leaves oblong. | |
| Calyx very small | 28. <i>Æ. Medusa.</i> |
| Calyx $\frac{1}{2}$ — $\frac{1}{10}$ in. long. | |
| Bracts linear | 29. <i>Æ. myrianthus.</i> |
| Bracts lanceolate or oblong | 30. <i>Æ. Welwitschii.</i> |
| Bracts ovate | 31. <i>Æ. Buettneri.</i> |
| Bracts obovate | 32. <i>Æ. petasatus.</i> |
| Leaves broadly ovate | 33. <i>Æ. zanzibaricus.</i> |
| ***CEPHALÆOLANTHUS.—Cymes congested into globose or oblong heads. | |
| Leaves lanceolate, subacute | 34. <i>Æ. Engleri.</i> |
| Leaves oblanceolate, obtuse. | 35. <i>Æ. Poggei.</i> |
| Calyx tubular | |

Calyx campanulate.	
Leaves sessile.	
Stems woody	36. <i>Æ. cryptanthus</i> .
Stems not woody	37. <i>Æ. conglomeratus</i> .
Leaves petioled	38. <i>Æ. floribundus</i> .
Leaves obovate	39. <i>Æ. obtusifolius</i> .

1. **Æ. ambustus**, *Oliv. in Trans. Linn. Soc.* xxix. 138, t. 136, fig. B. An erect much-branched annual, with stems a foot long and slender pubescent branchlets. Leaves sessile, ascending, thick, linear, 1–1½ in. long, glabrous on both surfaces, with rather revolute edges. Spikes numerous, slender, elongated, erect; bracts oblong-lanceolate, ascending, imbricate, foliaceous, ⅙ in. long. Calyx 1 lin. long, shortly 2-lobed. Corolla ⅓ in. long; tube narrowly funnel-shaped; lower lip oblong, as long as the tube; upper shorter, cuneate. Stamens as long as the lower lip.—Burkill & Wright in *Journ. Linn. Soc.* xxxiv. 271.

Nile Land. British East Africa: Madi, growing on rocks, *Grant!*

2. **Æ. virgatus**, *Gürke in Engl. Jahrb.* xxii. 146. A much-branched erect annual, with stems 1–1½ ft. long and pubescent branchlets. Leaves sessile, linear, ascending, entire, glabrous, 1–2 in. long. Spikes slender, elongated; bracts oblong-lanceolate, ascending, imbricate, ¼ in. long. Calyx 1 lin. long, obscurely lobed. Corolla ¼–⅓ in. long; lower lip oblong, shorter than the tube; upper half as long as the lower. Stamens longer than the lower lip.—Burkill & Wright in *Journ. Linn. Soc.* xxxiv. 272, figs. 5 and 6.

Nile Land. British East Africa: Bongo; at Gurfala, *Schweinfurth*, 2225!
Perhaps only a variety of *Æ. ambustus*.

3. **Æ. pinnatifidus**, *Hochst.; Benth. in DC. Prod.* xii. 80. An annual, with slender erect glabrous simple or branched stems 4–8 in. long. Leaves sessile, membranous, lanceolate or oblong, entire or crenate or deeply pinnatifid. Panicle small; spikes short, the side ones shortly peduncled; bracts oblong, foliaceous, imbricate, ⅙ in. long. Calyx short, campanulate. Corolla ⅓ in. long; lower lip obovate, longer than the tube. Stamens as long as the lower lip.—A. Rich. *Tent. Fl. Abyss.* ii. 186; *Engl. Hochgebirgsfl. Trop. Afr.* 362.

Nile Land. Abyssinia: on mountains in the province of Sana, *Schimper*, 1604! province of Shire, *Quartin-Dillon* (ex *Richard*); Tigre: *Mettgalo Mountain*, *Schimper*, 62 (ex *Engler*); and without precise locality, *Petit!*

4. **Æ. prittwitzianus**, *Gürke in Götzen, Durch Afrika von Ost nach West, Sonderabdr.* 8. Stem pubescent. Leaves sessile, lanceolate, ½–⅔ in. long, obtuse, entire, fleshy, pubescent on both surfaces. Cymes spicate; flowers sessile; bracts broadly ovate, obtuse, densely pubescent, ⅙ in. long. Calyx subcampanulate, subvillous, ⅓ in. long; throat truncate. Corolla subvillous.

South Central. Congo Free State: Kirunga Volcano, north of Lake Kivu, 6500 ft., *Götzen*, 14.

5. **Æ. abyssinicus**, *Hochst.; Benth. in DC. Prod.* xii. 80. A perennial, with long thick fusiform roots and short tufted slender glabrous stems ascending from a decumbent base. Leaves lanceolate, sessile, glabrous, moderately firm, 1–1½ in. long, entire or obscurely serrate. Panicle small, lax; lower branch-bracts foliaceous; spikes short; lateral shortly peduncled; flower-bracts oblong, foliaceous, ½ in. long. Calyx ⅙ in. long, obscurely lobed. Corolla ¼–⅓ in. long; lower lip orbicular, as long as the tube. Stamens as long as the lower lip.—*A. Rich. Tent. Fl. Abyss. ii.* 185; *Engl. Hochgebirgsfl. Trop. Afr.* 362.

Nile Land. Abyssinia: Mount Shoata, 7000–8000 ft., *Schimper*, 1355! and without precise locality, *Schimper*, 562!

6. **Æ. Stuhlmannii**, *Gürke in Engl. Pfl. Ost-Afr. C.* 345. A much-branched undershrub, with glabrous stem and branchlets. Leaves sessile, quite glabrous, rather fleshy; lower bipinnatifid, with linear-lanceolate lobes; upper simply pinnatifid or linear-lanceolate, entire. Cymes forming a terminal spike; flowers sessile; bracts round or broadly ovate, subvillous, rather longer than the calyx, deciduous. Calyx campanulate, circumscissile below the middle, truncate, subvillous outside in the upper part. Corolla-tube narrow; upper lip nearly entire; lower with 4 round lobes. Stamens and style exerted.

Mozamb. Dist. German East Africa: in the region south of the Victoria Nyanza at Mwanza and in the Usiha district, *Stuhlmann*, 4204, 4658.

7. **Æ. Holstii**, *Gürke in Engl. Jahrb.* xix. 221. Stem branched, pubescent, 8–9 in. long. Lower leaves shortly petioled, upper sessile, all oblong or oblong-lanceolate, under 1 in. long, obscurely and irregularly toothed, narrowed to the base, sparsely pubescent above, dotted with black glands beneath. Bracts lanceolate, sessile, subacute, pilose, ⅙–⅓ in. long; flowers sessile. Calyx cylindrical, pubescent, ⅓–⅙ in. long; upper tooth deltoid; lateral lanceolate-deltoid; lower round-ovate, connate. Corolla ⅓–½ in. long; tube broad, deflexed at the base; upper lip 4-toothed, lower cymbiform.

Mozamb. Dist. German East Africa: Usambara; near Mlalo, *Holst*, 421.

8. **Æ. ukamensis**, *Gürke in Engl. Jahrb.* xxii. 147. Stem and branches pubescent or subglabrous. Leaves shortly petioled, ovate-lanceolate, 1½ in. long, entire or obscurely crenate, rather fleshy, pubescent on both surfaces. Cymes lax; branches long, flexuose, pubescent, often curved at the tip; flowers remote, sessile; bracts ovate-lanceolate, acute, pubescent. Fruit-calyx ⅙–⅓ in. long, longer than the bract, tubular, curved, pubescent, truncate.

Mozamb. Dist. German East Africa: Ukame; Gwale, 6000 ft., *Stuhlmann*, 8160. British Central Africa: Nyasaland: Shire Highlands, *Buchanan*, 891A.

9. **Æ. rivularis**, *Hiern in Cat. Afr. Pl. Welw.* i. 869. An annual succulent subglabrous herb, with prostrate stems 4–9 in. long, divaricately branched in the lower part. Leaves ovate or elliptical, ¼–1 in. long, subobtuse, narrowed to the base, the lower shortly petioled.

Flowers in paniced divaricate spikes; bracts up to $\frac{1}{5}$ in. long, usually smaller. Calyx very small, subtruncate at the mouth. Corolla violet, $\frac{1}{4}$ in. long; lower lip deeply 3-lobed.

Lower Guinea. Angola: Pungo Andongo, on gneiss rocks by the streams of the Præsidium, *Welwitsch*, 1630, 5591.

10. **Æ. Candelabrum**, *Briquet in Engl. Jahrb.* xix. 186. An undershrub, with thinly pubescent young branches. Leaves shortly petioled, ovate-oblong, $1\frac{1}{2}$ in. long, 1 in. broad, obtuse, cuneate at the base, subentire, irregularly sinuate, fleshy, green and glabrous on both surfaces. Inflorescence candelabriform; cymes with a long peduncle, usually trifid at the apex; flowers crowded, sessile; bracts oblong-lanceolate, persistent, $\frac{1}{8}$ – $\frac{1}{4}$ in. long. Flower-calyx $\frac{1}{8}$ in. long, almost truncate. Corolla protruding $\frac{1}{3}$ – $\frac{1}{2}$ in. from the throat of the calyx; lower lip $\frac{1}{8}$ in. long. Stamens exserted.

Lower Guinea. Angola: province of Pungo Andongo, *Mechow*, 146.

11. **Æ. nyikensis**, *Baker in Kew Bulletin*, 1898, 160. An erect undershrub. Branchlets slender, ascending, pubescent. Leaves shortly petioled, suborbicular, 1– $1\frac{1}{2}$ in. long, membranous, deeply inciso-crenate, cuneate and entire at the base, green and pubescent on both surfaces. Spikes short, dense, forming a lax terminal panicle; bracts ovate, acute, $\frac{1}{6}$ – $\frac{1}{4}$ in. long, membranous, pubescent. Calyx very short; lips ovate. Corolla $\frac{1}{3}$ in. long; tube cylindrical, much longer than the calyx; lips small. Stamens as long as the corolla.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte*, 119!

12. **Æ. cuneifolius**, *Baker*. A shrub, with thick straight woody glabrous stems. Leaves long-petioled, oblong or rhomboid, crenate in the upper half, thick, rather fleshy, glabrous. Panicle moderately large; branches short, erecto-patent, simple, the lower arising from full-sized leaves; spikes short, oblong; bracts ovate, acute, imbricate, foliaceous, $\frac{1}{8}$ in. long. Calyx campanulate, $\frac{1}{12}$ in. long. Corolla $\frac{1}{4}$ in. long; tube very slender; lower lip rather shorter than the tube.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5480!

13. **Æ. buchnerianus**, *Briquet in Engl. Jahrb.* xix. 187. A branched undershrub; branches terete, minutely pubescent when young. Leaves petioled, ovate-oblong, 1– $1\frac{1}{2}$ in. long, $\frac{1}{2}$ – $\frac{3}{4}$ in. broad, cuspidate, rounded or narrowed to the base, irregularly crenate, fleshy, pubescent on both surfaces. Inflorescence very compound, 6–8 in. long; cymes elongated, above 1 in. long; flowers sessile; bracts ovate, pilose, coloured, much imbricate, $\frac{1}{12}$ to $\frac{1}{8}$ in. long. Flower-calyx pilose, campanulate, bilabiate, $\frac{1}{8}$ in. long. Corolla protruded $\frac{1}{3}$ in. from the throat of the calyx; lower lip $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Stamens much exserted.

South Central. Congo Free State: rocks of the Bango, in savannah, *Buchner*, 571.

14. **Æ. fruticosus**, *Gürke in Engl. Pfl. Ost-Afr. C.* 346. An undershrub, with glabrous branched stems. Leaves distinctly petioled, ovate, $1\frac{1}{2}$ –2 in. long, acute, narrowed to the base, membranous, obsolete crenate, glabrous on both surfaces. Flowers sessile; bracts lanceolate, acute, pubescent. Calyx truncate, accrescent, circumscissile.

Mozamb. Dist. German East Africa: Gonda, *Böhm*, 1080A.

15. **Æ. elsholtzioides**, *Briquet in Engl. Jahrb.* xix. 187. Annual. Stems much-branched, from a decumbent base, densely pubescent upwards. Leaves long-petioled, broadly ovate, thin, glabrous, fleshy, inciso-crenate, 1–2 in. long. Panicle small; end spikes oblong, $1-1\frac{1}{2}$ in. long; lateral spikes shorter, on short ascending peduncles; bracts oblong-lanceolate, imbricate, acute, foliaceous, pubescent, $\frac{1}{8}$ – $\frac{1}{4}$ in. long. Calyx campanulate, obscurely bilabiate, $\frac{1}{8}$ in. long. Corolla $\frac{1}{3}$ in. long; lower lip oblong, as long as the tube. Stamens as long as the lower lip.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5478! 5479!

16. **Æ. panganensis**, *Gürke in Engl. Pfl. Ost-Afr. C.* 346. Stem herbaceous, pubescent upwards. Leaves distinctly petioled, ovate, $1-1\frac{1}{2}$ in. long, obtuse, narrowed to the base, thin, rather fleshy, irregularly crenate, pubescent on the prominent ribs on both surfaces, glabrous between the ribs. Inflorescence branched; branches erect; bracts ovate-lanceolate, sessile. Calyx pilose, truncate or nearly so, accrescent, circumscissile.

Mozamb. Dist. German East Africa: Usambara; Pangani, *Stuhlmann*, 472.

17. **Æ. Njassæ**, *Gürke in Engl. Pfl. Ost-Afr. C.* 346. Stems shrubby, glabrous. Leaves distinctly petioled, ovate, $1-1\frac{1}{2}$ in. long, acute, cuneate at the base, crenate, glabrous on both surfaces. Cymes short, forming an ample panicle; flowers sessile; bracts broadly ovate, cuspidate, $\frac{1}{8}$ in. long, tinged with purple. Calyx tubular, rather pilose, $\frac{1}{8}$ in. long, obscurely lobed, circumscissile above the persistent base. Corolla twice as long as the calyx.

Mozamb. Dist. British Central Africa: Nyasaland; Baramsale, *Nicholson!* Plateau of Mount Zomba, 5000–6000 ft., *Whyte!* and without precise locality, *Buchanan*, 524! 529!

18. **Æ. Stormsii**, *Gürke in Bull. Herb. Boiss.* iv. 820. Stem and branches pubescent. Leaves petioled, obovate-spathulate, 2 in. long, obtuse, narrowed to the base, irregularly serrate, fleshy, pubescent on both surfaces. Bracts lanceolate, as long as the calyx; flowers sessile. Calyx globose, pubescent, truncate, obliquely circumscissile; persistent base oblong. Corolla unknown.

Mozamb. Dist. German East Africa: Karema, on Lake Tanganyika, *Storms*, 13.

19. **Æ. heliotropioides**, *Oliv. in Trans. Linn. Soc.* xxix. 137, t. 82. An annual, with much-branched robust stems 2 ft. long and

slender pubescent branchlets. Leaves sessile, thin, subglabrous, oblong or linear-oblong, obtuse, entire or obscurely crenate, the lower 2 in. long. Panicles lax, moderately large; branches very compound; final spikes slender, subsecund, 1–2 in. long; bracts very small. Calyx very small, truncate, pubescent. Corolla pubescent, $\frac{1}{4}$ in. long; lower lip orbicular, concave, not longer than the upper. Stamens as long as the lower lip.

Nile Land. British East Africa: Unyoro; in forests, growing by surface rocks, *Speke & Grant!* Kavirondo, in dry places, *Scott-Elliott, 7117!*

20. **Æ. elongatus**, *Briquet in Engl. Jahrb.* xix. 188. An annual, with an erect slender simple finely pubescent stem 1 ft. long, from a decumbent base. Leaves distinctly petioled, small, oblong, obtuse, slightly pubescent, entire or obscurely crenate. Panicle small; branches simple; spikes lax, 1–1 $\frac{1}{2}$ in. long; bracts lanceolate, minute. Calyx campanulate, $\frac{1}{12}$ in. long, obscurely bilabiate. Corolla $\frac{1}{4}$ in. long; lower lip oblong, concave, as long as the tube; upper shorter. Stamens not longer than the lower lip.

Lower Guinea. Angola: provinces of Huilla and Pungo Andongo, *Welwitsch, 5592! 5597, 5598!*

21. **Æ. pubescens**, *Benth. in DC. Prod.* xii. 80. An annual, with branched erect slender stems, 2–3 ft. long, pubescent upwards. Leaves petioled, thin, slightly pubescent, oblong or lanceolate, entire or obscurely crenate, 1–2 in. long. Panicle large, very lax; branches erecto-patent, compound; spikes slender, at most 1–1 $\frac{1}{2}$ in. long; bracts minute. Calyx $\frac{1}{12}$ in. long, obscurely bilabiate, pubescent. Corolla bright blue, $\frac{1}{4}$ – $\frac{1}{3}$ in. long; lower lip oblong, concave, nearly as long as the slender tube, pubescent outside. Stamens not protruded beyond the lower lip.—*Benth. in Hook. Niger Fl.* 489.

Upper Guinea. Lagos: Abeokuta, *Irving, 112!* Niger Territory: near the River Quorra (Niger) at Jeba, *Barter!* Lower Niger; Mount Patteh, *Vogel, 174!*

22. **Æ. Cameronii**, *Burkill in Journ. Linn. Soc.* xxxiv. 273. Annual. Stems tall, erect, fragile, red-brown, nearly glabrous. Leaves shortly petioled, distant, opposite, oblong, 1 in. long, acute, deeply toothed, entire and cuneate at the base, green and nearly glabrous on both surfaces. Cymes spicate, scorpioid, peduncled, forming a very lax ample panicle; bracts lanceolate, small. Calyx $\frac{1}{8}$ in. long, tubular, slightly pubescent; teeth minute, deltoid. Corolla lilac; tube rather longer than the calyx, abruptly deflexed; lips equal, $\frac{1}{8}$ in. long, the lower deeply saccate. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; Namasi, *Cameron, 18!*

23. **Æ. tuberosus**, *Hiern, Cat. Afr. Pl. Welw.* i. 869. A perennial, with a slender erect square glabrous stem from a decumbent base, which sends out roots from its nodes. Leaves oblanceolate, firm, sessile, subentire, the lowest 1 in. long, the upper growing gradually smaller. Panicle small, with few distant erecto-patent very slender slightly pubescent branches; spikes lax, the end one 1 in. long; bracts small, oblong,

foliaceous. Calyx campanulate, not lobed, $\frac{1}{16}$ in. long. Corolla $\frac{1}{4}$ in. long; lower lip oblong, as long as the slender tube, with a pair of acute teeth at the base. Stamens not protruded beyond the lower lip.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 1628, 5595!

24. **Æ. repens**, *Oliv. in Trans. Linn. Soc.* xxix. 137, t. 136, fig. A. A perennial herb, with many erect branches from a decumbent woody main stem; branchlets very slender, pubescent. Leaves sessile, firm, pubescent, subentire, oblong or oblanceolate, the lowest 1 in. long. Panicle 2–6 in. long; branches slightly compound; spikes $\frac{1}{2}$ –1 in. long; rhachis and small lanceolate bracts densely pubescent. Calyx very small, pubescent, truncate. Corolla hairy, $\frac{1}{4}$ in. long; lower lip concave, shorter than the funnel-shaped tube. Stamens not longer than the lower lip.

Mozamb. Dist. German East Africa: Karagwe, on rocky moist ground, *Speke & Grant*, 150! 458!

25. **Æ. serpiculoides**, *Baker*. A perennial, with slender decumbent slightly pubescent stems, rooting from the lower nodes. Leaves sessile or shortly petioled, small, oblong, entire, pubescent. Panicle small; branches very compound; spikes very slender, at most 1 in. long; bracts very small, lanceolate; rhachis hollowed out opposite the flowers. Calyx $\frac{1}{2}$ in. long, circumscissile above the base. Corolla not seen.

Mozamb. Dist. British Central Africa: Nyasaland; Shire Highlands, *Buchanan*!

26. **Æ. sedoides**, *Hiern, Cat. Afr. Pl. Welw.* i. 870. A perennial, with trailing stems and pubescent branches. Leaves small, sessile, oblong, entire, densely pubescent. Panicle small, with several forked ascending subsecund densely pubescent branches; bracts small, foliaceous, oblong, densely pubescent. Calyx densely pubescent, $\frac{1}{12}$ in. long. Corolla-tube longer than the calyx, much dilated at the throat; lower lip with a sharp tooth on each side at the base.—*Oxyotis sedoides*, *Welw.* herb.

Lower Guinea. Angola: province of Pungo Andongo, 2400–3800 ft., *Welwitsch*, 1629! 5594!

27. **Æ. nodosus**, *Hiern, Cat. Afr. Pl. Welw.* i. 868. Stem stout, woody, stiffly erect, brown, glossy, glabrous. Leaves subsessile or shortly petioled, ovate or oblong, thick, obscurely crenate, $1\frac{1}{2}$ in. long, subglabrous above when mature, pubescent mainly beneath on the very ascending veins. Panicle lax, very large (8–9 in. long); branches distant, very compound, erecto-patent; spikes very lax, the largest $1-1\frac{1}{2}$ in. long; bracts small, lanceolate. Calyx oblong, $\frac{1}{8}$ in. long, slightly lobed. Corolla twice as long as the calyx.—*Oxyotis nodosa*, *Welw.* herb.

Lower Guinea. Angola: province of Pungo Andongo, 2400–3800 ft., *Welwitsch*, 1627! 5596!

28. **Æ. Medusa**, *Baker*. Stem woody, straight, slender, pubescent. Leaves distinctly petioled, small, thick, oblong, obscurely toothed, pubescent. Panicle short, with two remote lower branches; branches short, ascending, very compound; spikes slender, secund, at most 1 in. long; bracts obsolete. Calyx globose, $\frac{1}{2}$ lin. long, densely clothed with white hairs. Corolla not seen.

Mozamb. Dist. Portuguese East Africa: mountains east of Lake Nyasa, *Johnson!*

29. **Æ. myrianthus**, *Baker*. A tall erect perennial herb, with subglabrous purple stems. Leaves shortly petioled, oblong-cuneate, 2–3 in. long, obtuse, distinctly crenate, cuneate at the base, the blade decurrent on the petiole, subcoriaceous, green and nearly glabrous on both surfaces. Inflorescence a nearly leafless lax thyrsoid panicle 1 ft. long; cymes peduncled, very compound; branches lax, scorpioid; flower-bracts linear, longer than the calyx. Calyx campanulate, pubescent, $\frac{1}{8}$ in. long; teeth minute. Corolla $\frac{3}{4}$ in. long; tube slender, subcylindrical; upper lip as long as the tube. Stamens shorter than the lip.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, south of Lake Tanganyika, 5000 ft., *Nutt!*

30. **Æ. Welwitschii**, *Briquet in Engl. Jahrb.* xix. 188. A shrub, with woody glossy glabrous brown branches. Leaves small, petioled, oblong, acute, subentire, thick, fleshy, glabrous. Panicle short; branches few, 2–3-furcate; spikes very lax, at most 1 in. long; bracts small, green, lanceolate or oblong. Calyx campanulate, obscurely bilabiate, $\frac{1}{12}$ in. long. Corolla $\frac{1}{3}$ in. long; lower lip nearly as long as the tube. Stamens not longer than the lower lip.—*Hiern, Cat. Afr. Pl. Welw. i.* 868.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5481! 5482!

31. **Æ. Buettneri**, *Gürke in Engl. Jahrb.* xix. 222. Stems erect, branched, 1–1 $\frac{1}{2}$ ft. long, perennial, glabrous or puberulous. Leaves distinctly petioled, oblong, rarely ovate, narrowed to the base, subobtuse, 2 in. long, under 1 in. broad, membranous, entire or obscurely crenate, glabrous on both sides. Bracts ovate, pilose, gland-dotted, $\frac{1}{12}$ in. long. Calyx pilose, truncate, $\frac{1}{2}$ lin. long in the flowering stage, in fruit $\frac{1}{12}$ – $\frac{1}{10}$ in., the lower part persistent, shield-shaped. Corolla $\frac{1}{3}$ – $\frac{1}{2}$ in. long; tube narrow; upper lip 4-lobed, lower cymbiform.

Upper Guinea. Togoland: near Bismarckburg, *Büttner*, 235, 250! in the Ketschenko Steppe, *Büttner*, 349.

32. **Æ. petasatus**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 62. A tall herb. Stem robust, minutely pubescent; internodes long. Leaves shortly petioled, oblong, $\frac{1}{2}$ – $\frac{3}{4}$ in. long, obtuse, narrowed to the base, entire or obscurely denticulate, green, pubescent. Spikes 2–3 in. long; whorls 1-flowered; internodes short; bracts obovate, $\frac{1}{18}$ – $\frac{1}{10}$ in. long. Calyx in flower $\frac{1}{8}$ in., in fruit $\frac{1}{8}$ in. long; lobes very small. Corolla

protruding $\frac{1}{4}$ in. from the throat of the calyx; lobes $\frac{1}{16}$ – $\frac{1}{10}$ in. long. Stamens finally exserted.

South Central. Congo Free State: Ubwoire, *Descamps*.

33. **Æ. zanzibaricus**, *S. Moore in Journ. Bot.* 1877, 68. A much-branched undershrub, with glabrous rather fleshy stems. Leaves petioled, broadly ovate, obtuse, 1–1½ in. long, broadly cuneate or subtruncate at the base, membranous, rather fleshy, glabrous, obscurely crenate. Panicle very sparse; spikes very lax, the longest 2–3 in. long; bracts very small. Calyx subcylindrical, $\frac{1}{8}$ in. long, circumscissile above the base. Corolla $\frac{1}{3}$ in. long; lower lip oblong, as long as the tube. Stamens not protruded beyond the lower lip.—*Burkill & Wright in Journ. Linn. Soc.* xxxiv. 273.

Nile Land. British East Africa: Kilimanjaro Expedition, 40–60 miles from the coast, *Johnston!*

Mozamb. Dist. German East Africa: Usambara; Doda, *Holst*, 2957! Usaramo; Bagamoyo, wooded banks of the Kingani River, *Hildebrandt*, 1265!

34. **Æ. Engleri**, *Briquet in Engl. Jahrb.* xix. 189. An undershrub, with glabrous young branches. Leaves sessile, lanceolate, 1 in. long, $\frac{1}{4}$ in. broad, subacute, narrowed to the base, entire, rather fleshy, green and glabrous on both surfaces. Cymes forming a dense terminal spike 1–2 in. long; flowers sessile; bracts crowded, oblong, coloured. Calyx $\frac{1}{6}$ in. long, pubescent; mouth truncate. Corolla protruding $\frac{1}{4}$ in. beyond the calyx; upper lip very small; lower much larger, concave. Stamens not exserted.—*Hiern, Cat. Afr. Pl. Welw.* i. 871.

Lower Guinea. Angola, *Welwitsch*, 5615. Malange, *Mechow*, 453.

35. **Æ. Poggei**, *Gürke in Engl. Jahrb.* xxii. 148. A shrub, with erect glabrous branches. Leaves shortly petioled, oblanceolate-spathulate, 3–4 in. long, $\frac{1}{2}$ in. broad, obtuse, entire or obscurely crenate towards the tip, glabrous on both surfaces, the ribs prominent beneath. Inflorescence capitate; bracts obovate or oblong, $\frac{1}{5}$ – $\frac{1}{4}$ in. long. Fruit-calyx tubular, shorter than the bract, truncate at the throat.

South Central. Congo Free State: Lulua River, *Pogge*, 342.

36. **Æ. cryptanthus**, *Baker*. Perennial. Stems woody; finely pubescent. Leaves sessile, oblanceolate-oblong, firm, subentire, pubescent, 1–2 in. long. Panicle small, composed of a few dense globose or oblong spikes; bracts oblong, much imbricate, foliaceous, pubescent, $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Calyx campanulate, $\frac{1}{3}$ in. long. Corolla not seen.

Lower Guinea. Angola, *Welwitsch*, 5616!

37. **Æ. conglomeratus**, *Baker*. A perennial herb, with stout erect virgate shortly pubescent stems 2–3 ft. long. Leaves sessile, oblanceolate, ascending, thick, pubescent, obscurely crenate, the lower 2–3 in. long. Panicle long, narrow, composed of numerous globose clusters $\frac{3}{4}$ in. diam., the side ones on short erecto-patent peduncles;

bracts in pairs, foliaceous, oblong-lanceolate, pubescent, imbricate, $\frac{1}{3}$ in. long. Calyx campanulate, $\frac{1}{8}$ in. long. Corolla $\frac{1}{3}$ in. long; lower lip shorter than the tube. Stamens not exerted beyond the lower lip.—*Æolanthus* sp., Burkill & Wright in Journ. Linn. Soc. xxxiv. 272, fig. 7.

Mozamb. Dist. British Central Africa: Nyasaland; Shire Highlands, in marshes, *Buchanan*, 459! Fort Hill, Tanganyika plateau, 3500–4000 ft., *Whyte*!

38. **Æ. floribundus**, *Briquet in Engl. Jahrb.* xix. 190. An undershrub, with erect branches, clothed with grey pubescence. Leaves petioled, oblanceolate, 1 in. long, $\frac{1}{8}$ – $\frac{1}{3}$ in. broad, obtuse, narrowed to the base, entire, green and glabrous on both surfaces. Cymes sessile, aggregated in a dense terminal raceme 5–6 in. long; bracts oblong, coloured. Calyx small, campanulate, with 5 obscure teeth. Corolla pale violet, $\frac{3}{4}$ in. long; tube incurved, dilated in the upper half, nearly $\frac{1}{2}$ in. long; lower lip $\frac{1}{3}$ in. long. Stamens not exerted.

Lower Guinea. Angola; near Moina, *Buchner*, 82.

39. **Æ. obtusifolius**, *Briquet in Engl. Jahrb.* xix. 189. An undershrub, with straight branches, clothed with short adpressed pubescence. Leaves shortly petioled, obovate, $\frac{1}{2}$ in. long, $\frac{1}{3}$ in. broad, obtuse, narrowed to the base, entire, pubescent on both surfaces, green above, grey beneath. Cymes shortly peduncled, aggregated in a dense terminal raceme 5–6 in. long; bracts oblong, coloured, about $\frac{1}{4}$ in. long. Flower-calyx campanulate, $\frac{1}{12}$ in. long; teeth very minute. Corolla $\frac{1}{2}$ in. long; tube much exerted, incurved; lower lip $\frac{1}{4}$ in. long. Stamens not exerted.

Lower Guinea. Angola; Malange, *Welwitsch (Mechow?)*, 473.

Imperfectly known species.

40. **Æ. ndorensis**, *Schweinf. in Höhnel Zum Rudolph-See u. Stephanie-See, Sonderabdr.* 6. Suffruticose, with succulent pubescent branches. Leaves elliptic, sessile. Corolla pubescent outside. Stamens longer than the lower lip.—*Engl. Hochgebirgsfl. Trop. Afr.* 362.

Nile Land. British East Africa: Ndoro, on the western slope of Mount Kenia, 6350 ft., *Höhnel*.

13. **PLECTRANTHUS**, L'Hérit.; Benth. et Hook. f. *Gen. Pl.* ii. 1175.

Calyx slightly accrescent, usually declinate in the fruiting stage; tube oblong or campanulate, often gibbous at the base; teeth subequal, deltoid, or unequal, the upper ovate and reflexed, the others cuspidate. Stamens 4, didynamous, declinate; filaments free (except in 78. *P. insolitus*), filiform; anther-cells usually confluent. Disk produced into a gland, which is sometimes longer than the ovary. Style shortly bifid. Nucules ovoid or oblong, smooth or punctate.—Annual or perennial herbs or undershrubs. Leaves very various in shape and size, petioled or sessile. Flowers solitary or in axillary more or less developed cymes,

forming a racemose or paniculate inflorescence; bracts usually small, foliaceous. Flowers small or medium-sized, usually lilac or blue. Stamens usually reaching to the tip of the lowerlip of the corolla.

Species 80-100 or more, spread through all the warmer regions of the Old World, extending to the Cape, Madagascar, and Mauritius.

*GERMANEA.—Upper tooth of the calyx ovate; four lower narrow, acuminate. Leaves opposite.

†Cymes reduced to a single flower.

Bracts lanceolate-subulate 1. *P. melanocarpus*.

Bracts broadly ovate 2. *P. tetragonus*.

Bracts minute or obsolete 3. *P. biflorus*.

††Cymes umbellate, inflorescence racemose.

Leaves sessile.

Annual 4. *P. modestus*.

Herbaceous perennials.

Leaves lanceolate 5. *P. stenophyllus*.

Leaves oblong.

Leaves 2-3 in. long 6. *P. zombensis*.

Leaves 6-7 in. long 7. *P. Buchananii*.

Leaves ovate or oblong 8. *P. stachyoides*.

Leaves obovate-cuneate 9. *P. Lastii*.

Undershrub 10. *P. floribundus*.

Leaves with a short petiole.

Leaves ovate.

Fruit-calyx $\frac{1}{12}$ - $\frac{1}{8}$ in. long 11. *P. minimus*.

Fruit-calyx $\frac{1}{3}$ in. long 12. *P. ovatifolius*.

Leaves obovate or suborbicular.

A creeping herb 13. *P. prostratus*.

An erect undershrub 14. *P. Fischeri*.

Leaves distinctly petioled.

Leaves oblong 15. *P. insignis*.

Leaves ovate-oblong 16. *P. miserabilis*.

Leaves ovate.

Whorls 2-3-flowered.

Fruit-calyx $\frac{1}{12}$ in. long 17. *P. mandalensis*.

Fruit-calyx $\frac{1}{6}$ in. long.

Annual 18. *P. pauciflorus*.

Perennial.

Leaves glabrous 19. *P. masukensis*.

Leaves pubescent 20. *P. brevipes*.

Whorls 3-6-flowered.

Pedicels very short 21. *P. manganjensis*.

Pedicels $\frac{1}{5}$ in. long.

Leaves membranous, small 22. *P. Holstii*.

Leaves membranous, large 23. *P. longipes*.

Leaves moderately thick 24. *P. Emini*.

Pedicels long.

Lower teeth of calyx deltoid 25. *P. flaccidus*.

Lower teeth of calyx lanceolate.

Calyx clothed with long fine glandular hairs 26. *P. crenatus*.

Calyx clothed with rigid or robust crisped hairs 27. *P. phryxotrichus*.

Whorls many-flowered.

- Leaves glabrous or subglabrous.
 Leaves cordate at the base 28. *P. fragilis*.
 Leaves cuneate at the base 29. *P. sylvestris*.
 Leaves slightly pubescent.
 Calyx-tube campanulate.
 Racemes dense 30. *P. punctatus*.
 Racemes very lax 31. *P. kamerunensis*.
 Calyx-tube oblong 32. *P. Mannii*.
 Leaves densely pubescent.
 Leaves membranous 33. *P. rupestris*.
 Leaves fleshy 34. *P. quadridentatus*.
 Leaves subtomentose on both surfaces 35. *P. cyaneus*.
 Leaves orbicular.
 Leaves glabrous 36. *P. sphaerophyllus*.
 Leaves slightly pubescent 37. *P. microphyllus*.
 Leaves laxly lanate 38. *P. paucicrenatus*.
 †† Cymes not strictly sessile and umbellate.
 Cymes long scorpioid 39. *P. herbaceus*.
 Cymes corymbose.
 Leaves oblong 40. *P. bongensis*.
 Leaves ovate.
 Calyx very small.
 Leaves cordate at the base 41. *P. glandulosus*.
 Leaves cuneate at the base 42. *P. elegans*.
 Calyx $\frac{1}{8}$ — $\frac{1}{6}$ in. long.
 Racemes short.
 Leaves crenate.
 Lower calyx-teeth small 43. *P. parvus*.
 Lower calyx-teeth large 44. *P. Johnstonii*.
 Leaves serrate 45. *P. pratensis*.
 Racemes long, lax 46. *P. urticoides*.
 Calyx $\frac{1}{6}$ — $\frac{1}{3}$ in. long.
 Leaves small.
 Leaves glabrous 47. *P. chiradzulensis*.
 Leaves sparsely clothed with long hairs 48. *P. usambarensis*.
 Leaves pubescent 49. *P. albus*.
 Leaves large.
 Leaves glabrous 50. *P. violaceus*.
 Leaves sparsely clothed with adpressed hairs 51. *P. hylophilus*.
 Leaves orbicular 52. *P. orbicularis*.
 Leaves rhomboid, deeply cut 53. *P. schizophyllus*.
 **ISODON. Calyx-teeth subequal. Leaves opposite.
 † Cymes sessile, umbellate. Inflorescence racemose.
 Leaves sessile or subsessile 54. *P. lycopifolius*.
 Herbaceous perennial.
 Shrubs with woody branches.
 Calyx $\frac{1}{16}$ in. long in flower.
 Leaves entire 55. *P. moschosmoides*.
 Leaves crenate 56. *P. cylindraceus*.
 Calyx $\frac{1}{12}$ in. long 57. *P. marrubioides*.
 Calyx $\frac{1}{8}$ — $\frac{1}{6}$ in. long.
 Calyx-teeth lanceolate 58. *P. sanguineus*.
 Calyx-teeth linear 59. *P. primulinus*.
 Calyx $\frac{1}{6}$ — $\frac{1}{5}$ in. long 60. *P. densus*.

- Leaves distinctly petioled.
- Annuals 61. *P. stenosiphon*.
- Perennial herbs.
- Raceme dense 62. *P. betonicæfolius*.
- Raceme lax.
- Hairs long and bristly 63. *P. horridus*.
- Hairs short and soft 64. *P. pubescens*.
- Undershrub 65. *P. nyikensis*.
- ††Cymes not strictly umbellate. Inflorescence more or less
paniculate.
- Lower lip of the corolla large.
- Cymes dense, shortly peduncled.
- Cymes 3-flowered 66. *P. triflorus*.
- Cymes many-flowered 67. *P. matabelensis*.
- Cymes laxly corymbose.
- Shrub, with woody branches 68. *P. defoliatu*s.
- Herbs.
- Cymes 3-flowered.
- Fruit-calyx $\frac{1}{8}$ in. long 69. *P. kondowensis*.
- Fruit-calyx $\frac{1}{3}$ in. long 70. *P. Zenkeri*.
- Cymes many-flowered 71. *P. Schimper*i.
- Lower lip of corolla small.
- Corolla $\frac{1}{6}$ in. long 72. *P. ramosissimus*.
- Corolla $\frac{1}{4}$ in. long.
- Stamens shortly exerted 73. *P. hoslundio*ides.
- Stamens not exerted 74. *P. Whyte*i.
- Corolla $\frac{1}{3}$ in. long 75. *P. paniculatus*.
- ***SYMPHOSTEMON. Upper tooth of calyx ovate; lower
triangular. Filaments shortly united. Leaves
alternate 76. *P. insolitu*s.

1. **P. melanocarpus**, *Gürke in Engl. Jahrb.* xix. 209. Stems erect, branched, tetragonous, clothed with long very thick spreading hairs. Leaves unknown. Inflorescence a much-branched panicle; flowers solitary in the axils of the lanceolate-subulate bracts; pedicels long, glandular-pubescent, as are the calyx and axis. Fruit-calyx $\frac{1}{4}$ – $\frac{1}{3}$ in. long, tubular, curved; upper tooth orbicular, obtuse; lateral longer, lanceolate, acuminate; lowest longest, lanceolate-subulate, acuminate.

Mozamb. Dist. German East Africa: Masai Steppe, *Fischer*, 511.

2. **P. tetragonus**, *Gürke in Engl. Jahrb.* xix. 209. Stems erect, branched, tetragonous, 3 ft. long; glabrescent below, clothed upwards with long very thick spreading hairs. Leaves oblong, narrowed into a long petiole, acute, 3–4 in. long, 2–2½ in. broad, glabrous on both sides or hairy on the ribs beneath. Inflorescence a racemose panicle; flowers solitary in the axils of the round-ovate acuminate bracts; rhachis and pedicels shortly glandular-pubescent. Fruit-calyx $\frac{1}{3}$ in. long; tube campanulate; upper tooth round-ovate, acuminate, with slightly

decurrent edges; lateral as long, lanceolate-deltoid, acuminate; lower longer, lanceolate-subulate. Corolla pubescent, yellow; tube short.

Mozamb. Dist. German East Africa: Usambara: Masheua, 1500-1600 ft., *Holst*, 3573!

3. **P. biflorus**, *Baker*. An undershrub, with square woody branchlets, clothed with firm spreading strong brown hairs. Leaves unknown, produced after the flowers. Inflorescence a racemose terminal panicle; branches short, erecto-patent; flowers solitary; pedicels $\frac{1}{6}$ in. long, erecto-patent; bracts minute or obsolete. Fruit-calyx $\frac{1}{3}$ in. long; tube cylindrical, glandular-pubescent, rather recurved; upper tooth orbicular-cuspidate, $\frac{1}{3}$ the length of the tube; the others longer, lanceolate-cuspidate. Corolla not seen.

Mozamb. Dist. British Central Africa: Nyasaland; between Kondowe and Karonga, 2000-6000 ft., *Whyte*!

Very near *P. tetragonus*, *Gürke*, from which it differs by its long calyx-tube.

4 **P. modestus**, *Baker in Kew Bulletin*, 1895, 72. Stems slender, erect, annual, branched, pubescent, under 1 ft. long. Leaves few, sessile, lanceolate, the largest $1\frac{1}{2}$ -2 in. long, distinctly crenate, green and glabrous on both surfaces. Inflorescence racemose, lax, axillary; whorls 2-3-flowered; bracts minute; pedicels longer than the calyx. Calyx pubescent, $\frac{1}{8}$ in. long in the flowering stage; upper tooth orbicular, the others narrow, acute. Corolla $\frac{1}{2}$ in. long; tube twice the length of the calyx; upper lip small; lower larger, convex. Stamens included.

Mozamb. Dist. British Central Africa: Urungu: Fwambo, *Carson*!

5. **P. stenophyllus**, *Baker*. A perennial, with a slender simple erect pubescent stem 1 ft. long. Leaves sessile, lanceolate, subentire, very pubescent, ascending, 2-3 in. long, $\frac{1}{4}$ - $\frac{1}{3}$ in. broad, with copious black dots. Inflorescence racemose, long, lax, terminal; whorls 5-6-flowered; pedicels long, pubescent. Flower-calyx pubescent, $\frac{1}{8}$ in. long; tube campanulate; upper tooth ovate, as long as the tube; lower small, deltoid-cuspidate. Corolla $\frac{1}{2}$ in. long, pubescent outside; lower lip oblong-navicular, rather shorter than the tube.

Mozamb. Dist. British Central Africa: Nyasaland; near Blantyre, *Last*!

6. **P. zombensis**, *Baker*. A perennial, with erect simple or slightly-branched stems 2 ft. long, pubescent upwards. Leaves sessile, oblong, crenate, pubescent, ascending, 2-3 in. long. Inflorescence a slightly branched racemose panicle, moderately dense, 2-3 in. long; whorls many-flowered; pedicels short. Flower-calyx pubescent, $\frac{1}{6}$ in. long; tube campanulate; upper tooth ovate; 4 lower longer, lanceolate. Corolla twice as long as the calyx.

Mozamb. Dist. British Central Africa: Nyasaland; summit of Mount Zomba, *Buchanan*, 395!

7. **P. Buchananii**, *Baker*. Perennial. Leaves oblong, deeply crenate, narrowed gradually to a sessile base or a distinct petiole,

membranous, shortly pubescent on both sides, the lower 6–7 in. long, 3 in. broad at the middle. Inflorescence racemose, lax, 1 ft. or more long; flowers 15–20 in a whorl; pedicels pubescent, finally $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Fruit-calyx $\frac{1}{4}$ in. long; upper tooth large, ovate; 4 lower large cusps. Corolla $\frac{1}{3}$ – $\frac{1}{2}$ in. long.

Mozamb. Dist. British Central Africa: Nyasaland; Nakajumbu, in the Shire Highlands, *Buchanan*, 365!

8. **P. stachyoides**, *Oliv. in Trans. Linn. Soc.* xxix. 136, t. 81. A perennial herb, with stout erect simple pubescent stems 3–4 ft. long. Leaves nearly sessile, ovate or oblong, pubescent, conspicuously crenate, the lower 3 in. long. Inflorescence a dense narrow terminal racemose panicle, the end branch 6–8 in. long; whorls many-flowered; bracts ovate, pubescent, foliaceous, $\frac{1}{4}$ in. long; pedicels short. Fruit-calyx $\frac{1}{4}$ in. long; upper tooth ovate; 4 lower as long, deltoid-cuspidate; tube campanulate, very hairy. Corolla twice as long as the calyx.

Nile Land. British East Africa: Madi, in woods, *Speke & Grant*, 732!

9. **P. Lastii**, *Baker*. A perennial, with long simple slender pubescent stems. Lower leaves nearly sessile, obovate-cuneate, obscurely crenate, thick, pubescent, 1 in. long. Inflorescence racemose, lax; whorls many-flowered; pedicels pubescent, longer than the calyx. Flower-calyx pubescent, $\frac{1}{8}$ in. long; tube campanulate; upper tooth ovate, as long as the tube; 4 lower large, linear. Corolla $\frac{1}{3}$ in. long.

Mozamb. Dist. British Central Africa: Nyasaland; near Blantyre, *Last*!

10. **P. floribundus**, var. **longipes**, *N. E. Br. in Kew Bulletin*, 1894, 13. A shrub, reaching a height of 8–10 ft., without any leaves at the flowering season. Leaves (seen only in the Natal type) sessile, oblong, coriaceous, nearly entire, pubescent, 2–3 in. long. Inflorescence a long lax terminal racemose panicle; branches ascending, verticillate, 2–3 in. long; pedicels erecto-patent, $\frac{1}{6}$ – $\frac{1}{4}$ in. long, like the rhachis rough with glands; bracts small, oblong, acute, persistent. Calyx finally $\frac{1}{4}$ in. long, hairy and glandular; tube campanulate; upper lip ovate; lower teeth lanceolate. Corolla bright yellow, $\frac{1}{2}$ – $\frac{3}{4}$ in. long.

Lower Guinea. Angola: near the River Cunene, *Johnston*!

Mozamb. Dist. German East Africa: Lower Plateau, north of Lake Nyasa, *Thomson*! British Central Africa: Nyasaland; Manganja Hills, 1000–2000 ft., *Meller*! Moravi country, west of Lake Nyasa, *Kirk*! in woods near Blantyre, 3000 ft., *Scott*! Missale, *Nicholson*! and without precise locality, *Buchanan*, 885! Matabeleland: in the valley of the Umzingwane River, *Baines*!

The type, which has shorter pedicels, occurs in Natal and the Transvaal.

11. **P. minimus**, *Gürke in Engl. Jahrb.* xix. 205. Stems erect, very slender, pubescent, 1–4 in. long. Leaves very small, shortly petioled, ovate, crenate, rather thick, pubescent and dotted with black glands on both sides. Inflorescence racemose, very short; cymes 1–3-flowered, sessile; bracts ovate or ovate-lanceolate, very small; pedicels $\frac{1}{12}$ – $\frac{1}{8}$ in. long, pubescent like the calyx. Fruit-calyx $\frac{1}{12}$ – $\frac{1}{8}$ in. long;

upper tooth broad, ovate or roundish, obtuse; lateral deltoid, acute; lower lanceolate, acuminate.

Upper Guinea. Cameroons: near Buea, 7000 ft., *Preuss*, 1019.

12. **P. ovatifolius**, *Oliv. in. Trans. Linn. Soc.* xxix. 136, t. 135. An erect perennial, with many erecto-patent pubescent branches. Leaves many, shortly petioled, ovate, acute, membranous, pubescent, about 1 in. long. Inflorescence a lax terminal racemose panicle; branches 3-4 in. long; whorls few-flowered; pedicels pubescent, $\frac{1}{8}$ - $\frac{1}{6}$ in. long. Fruit-calyx $\frac{1}{3}$ in. long; upper tooth ovate, mucronate, shorter than the tube, with decurrent edges; lateral teeth small cusps; lower teeth large cusps. Corolla $\frac{1}{2}$ in. long.

Nile Land. British East Africa: Madi; in patches on flat ground near the Madi Burn, *Speke & Grant*!

13. **P. prostratus**, *Gürke in Engl. Jahrb.* xix. 206. Stems creeping, rooting at the nodes, pubescent. Leaves shortly petioled, small, obovate, fleshy, cuneate at the base, obtuse, undulated or obsoletely crenate on the margin, with a few adpressed hairs on both sides. Inflorescence racemose, lax; whorls 6-10-flowered; cymes sessile; pedicels $\frac{1}{5}$ - $\frac{1}{3}$ in. long, clothed like the calyx, with adpressed whitish hairs; bracts ovate, obtuse. Fruit-calyx $\frac{1}{10}$ - $\frac{1}{8}$ in. long; upper tooth round-ovate, subacute; the rest subequal, lanceolate, acuminate. Corolla violet.

Mozamb. Dist. German East Africa: at the foot of Rhinoceros Hill, at Pangani Ford, about 2700 ft., *Volkens*, 484; Ukira, east of Victoria Nyanza, *Fischer*, 497.

14. **P. Fischeri**, *Gürke in Engl. Jahrb.* xix. 200. Undershrub. Stems erect or ascending, pubescent above, glabrescent below. Leaves obovate or suborbicular, narrowed to a short petiole, obtuse or subacute, entire or obscurely crenate, $\frac{1}{2}$ - $1\frac{1}{2}$ in. long, thick, pubescent on both sides. Inflorescence racemose, very dense, terminal or shortly peduncled in the axils of the upper leaves; pedicels longer than the calyx; bracts suborbicular or ovate, acute, $\frac{1}{8}$ - $\frac{1}{6}$ in. long. Calyx $\frac{1}{12}$ in. long, clothed with long hairs; upper tooth larger, ovate; lower subequal, deltoid. Corolla blue; tube erect, pubescent; lips villous, outside.

Mozamb. Dist. German East Africa: hanging from rocks, near a stream in a forest on the slopes of Ugweno Mountain, near Kilimanjaro, 3900 ft., *Volkens*, 518; Masai Highlands, *Fischer*, ser. I. 77, ser. II. 501.

It has the habit of *P. cylindraceus*, Hochst.

15. **P. insignis**, *Hook f. in Journ. Linn. Soc.* vii. 210. A much-branched erect perennial herb, with stems 10-15 ft. long. Leaves long-petioled, oblong, membranous, inciso-crenate, slightly pubescent, acute, narrowed gradually from the middle to the base, the lower 6-9 in. long, 3-4 in. broad at the middle. Inflorescence a very lax ample terminal racemose panicle, the end branch 6-9 in. long; whorls

few-flowered; pedicels finally $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Calyx in flower $\frac{1}{3}$ in., in fruit $\frac{3}{4}$ in. long; tube oblong; upper tooth ovate, much shorter than the tube; lateral small cusps; lower very large cusps. Corolla $\frac{1}{2}$ in. long; lower lip oblong, as long as the tube.—Engl. Hochgebirgsfl Trop. Afr. 359.

Upper Guinea. Cameroons: Cameroon Mountain, 7000 ft., *Mann*, 1257!

16. **P. miserabilis**, *Briquet in Engl. Jahrb.* xix. 180. A herb, bearing tubercles, creeping at the base, then ascending to a height of 2 ft. Leaves petioled, ovate-oblong, above 1 in. long, acute, cuneate at the base, shallowly crenate, green and pubescent on both surfaces. Inflorescence racemose, long; lower whorls distant; bracts deciduous. Calyx very accrescent, $\frac{1}{2}$ lin. long in the flowering stage; upper tooth ovate, the lateral ovate, acuminate, the lowest setaceous. Corolla protruding $\frac{1}{12}$ – $\frac{1}{8}$ in. from the throat of the calyx; lower lip $\frac{1}{12}$ in. long. Stamens included, very protandrous.

South Central. Congo Free State: Lunda; Mukenge, in Bashilange district. *Pogge*, 1022.

17. **P. mandalensis**, *Baker*. An erect perennial, with short finely hairy tetragonous stems. Leaves long-petioled, membranous, broadly ovate or suborbicular, the lower 3–4 in. long and broad, deeply crenate, pubescent on both surfaces. Whorls 2–3 flowered, forming lax racemose panicles; pedicels $\frac{1}{8}$ in. long; bracts lanceolate. Flower-calyx $\frac{1}{12}$ in. long; tube campanulate; upper tooth small, ovate; lower longer, lanceolate. Corolla pale lilac, twice as long as the calyx.

Mozamb. Dist. British Central Africa: Nyasaland; Mandala, cultivated specimen, *Moir*!

Described from a specimen grown at Kew in Jan. 1894, which was raised from seed sent by Mr. J. Moir in 1893.

18. **P. pauciflorus**, *Baker*. A slender erect annual, with the habit of *Circea alpina*. Leaves small, distinctly petioled, ovate, crenate, membranous, obscurely pubescent. Inflorescence a very lax racemose panicle; branches 5, approximate, the end one 3 in. long; whorls 2-flowered; pedicels as long as the calyx. Calyx $\frac{1}{6}$ in. long; tube campanulate; upper tooth ovate, as long as the tube; lower as long, lanceolate. Corolla $\frac{1}{3}$ in. long; lower lip as long as the tube.

Mozamb. Dist. German East Africa: Unyamwezi; Msilala, *Hannington*!

19. **P. masukensis**, *Baker*. An erect branched perennial, with slender stems densely clothed with short spreading soft hairs. Leaves shortly petioled, ovate, very small, acute, crenate, broadly rounded at the base, nearly glabrous on both surfaces. Whorls usually 2-flowered, arranged in a long lax racemose panicle with a densely pilose rhachis; bracts minute, foliaceous; pedicels very short. Fruit-calyx densely pilose, $\frac{1}{8}$ in. long; tube campanulate; upper tooth ovate, obtuse, about

as long as the tube; the others small, deltoid. Corolla $\frac{1}{3}$ in. long. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; Masuka Plateau, 6500–9000 ft., *Whyte*, 299!

26. **P. brevipes**, *Baker*. A much-branched erect perennial, with slender pubescent stems. Leaves distinctly petioled, ovate, 1–1½ in. long, acute, deeply crenate, not cordate at the base, membranous, green and pubescent on both surfaces. Whorls 2–3-flowered, arranged in long lax racemose panicles; bracts obsolete; pedicels pubescent, $\frac{1}{12}$ – $\frac{1}{8}$ in. long. Fruit-calyx pilose, $\frac{1}{8}$ in. long; tube campanulate; upper tooth ovate, obtuse, nearly as long as the tube; lateral teeth small, deltoid; lower large, lanceolate. Corolla $\frac{1}{3}$ in. long. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte*!

21. **P. manganjensis**, *Baker*. A perennial erect shortly pubescent herb. Stems 2 ft. long. Leaves distinctly petioled, cordate-ovate, crenate, membranous, pubescent, the lower 1½ in. long and broad. Inflorescence racemose; branches 3, approximate, moderately dense, the end one 2–3 in. long; whorls few-flowered; pedicels short, pubescent. Flower-calyx pubescent, $\frac{1}{8}$ in. long; tube campanulate; upper tooth ovate, as long as the tube; 4 lower lanceolate, as long as the upper. Corolla $\frac{1}{3}$ in. long.

Mozamb. Dist. British Central Africa: Nyasaland; Manganja Highlands, *Kirk*! Mount Zomba, 4000–6000 ft., *Whyte*!

22. **P. Holstii**, *Gürke in Engl. Jahrb.* xix. 204. Stems slender, simple, glandular-pubescent. Leaves distinctly petioled, broadly ovate, membranous, under 1 in. long, acute, rounded at the base, dentate, pubescent on both sides. Inflorescence racemose, short; whorls distant, 4–6-flowered; cymes sessile; bracts broadly ovate, acute; pedicels $\frac{1}{5}$ in. long, glandular-pubescent, as are the calyx and axis. Fruit-calyx $\frac{1}{8}$ in. long; upper tooth broadly ovate, acute; lateral deltoid, acuminate; lower lanceolate-subulate, rigid, shorter than the upper. Corolla declinate, equal at the base.

Mozamb. Dist. German East Africa: Usambara; in damp places on low hills near Mlalo, *Holst*, 248.

23. **P. longipes**, *Baker*. A tall, much-branched, erect herb, with pubescent stems. Leaves with a very long petiole, ovate, 2–3 in. long, deeply crenate, not cordate at the base, green and slightly pubescent on both surfaces. Whorls 4–6-flowered, arranged in a long lax racemose panicle; bracts minute; pedicels $\frac{1}{8}$ – $\frac{1}{4}$ in. long. Fruit-calyx pilose, $\frac{1}{4}$ in. long; tube campanulate; upper teeth broadly ovate, as long as the tube; lower linear, as long. Corolla $\frac{1}{3}$ in. long; lower lip shorter than the tube. Stamens not exerted.—*P. herbaceus*, *Schweinf. Pl. Abyss.* Sept. Exsicc. No. 178, non *Briquet*.

Nile Land. Eritrea: Ginda, 3000 ft., *Schweinfurth*, 178!

Introduced into cultivation by Messrs. Dammann of Naples in 1894.

24. **P. Emini**, *Gürke in Engl. Jahrb.* xix. 207. Stems branched, pubescent. Leaves long-petioled, round-ovate, 1–1½ in. long, rather thick, obtuse or subcordate at the base, acute, pubescent on both sides. Inflorescence a lax racemose panicle; whorls remote, 4–6-flowered; cymes sessile or shortly peduncled; bracts small, ovate, acute; pedicels $\frac{1}{5}$ in. long, pubescent. Fruit-calyx $\frac{1}{5}$ in. long; upper tooth ovate, acute, the margins not decurrent; lateral as long, lanceolate-deltoid; lower longer, lanceolate. Corolla bent down at the base.

Mozamb. Dist. German East Africa: Karagwe; near Bukoba, *Stuhlmann*, 3882.

25. **P. flaccidus**, *Gürke in Engl. Jahrb.* xix. 206. Stem long, slender, erect, branched, fragile, slightly pubescent. Leaves long-petioled, ovate, membranous, deeply crenate, obscurely pubescent, 1–2 in. long; petiole clothed with soft spreading hairs. Inflorescence a very lax racemose panicle; branches long, slender; whorls 3–4-flowered; pedicels reaching $\frac{1}{4}$ in. long. Calyx finally $\frac{1}{6}$ in. long; upper tooth small, orbicular; 4 lower short, deltoid. Corolla $\frac{1}{4}$ in. long.—*Coleus flaccidus*, *Vatke in Linnæa*, xliii. 90.

Mozamb. Dist. German East Africa: Usaramo; Bagamoyo, *Hildebrandt*, 1264! Usambara; Doda, *Holst*, 2980!

26. **P. crenatus**, *Gürke in Engl. Jahrb.* xix. 208. Stems glandular-pubescent or subtomentose. Leaves long-petioled, round-ovate, 2 in. long and broad, acute, rounded at the base, glandular-pubescent or subtomentose on both surfaces. Whorls few-flowered; pedicels long. Flower-calyx $\frac{1}{8}$ – $\frac{1}{5}$ in. long, clothed with long fine glandular hairs; upper tooth ovate, acute; lateral shorter, lanceolate-deltoid; lower lanceolate, acuminate. Corolla blue.

Mozamb. Dist. German East Africa: Usambara; among shrubs in clearings near Masheua, 4000 ft., *Holst*, 8730.

27. **P. phryxotrichus**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 66. An undershrub, with ascending dull green branches, clothed with long crisped hairs, mixed with short adpressed pubescence. Leaves distinctly petioled, broadly ovate, under 1 in. long, acute or subobtuse, closely crenate, cordate or subcordate at the base, dark green and glabrescent above, paler and pubescent beneath. Inflorescence racemose, lax, 3–4 in. long; whorls simple, 2–6-flowered; pedicels $\frac{1}{4}$ in. long; bracts small, ovate-lanceolate, deciduous. Flower-calyx $\frac{1}{3}$ in. long, clothed with rigid or robust spreading hairs; tube campanulate; upper tooth ovate, the rest lanceolate, acuminate. Corolla whitish-lilac, protruding $\frac{1}{8}$ – $\frac{1}{5}$ in. from the throat of the calyx; lower lip $\frac{1}{3}$ in. long. Stamens finally exerted.

Lower Guinea? Congo, *Dewèvre*, 862A.

28. **P. fragilis**, *Baker*. An annual, with slender erect simple fragile obscurely pubescent stems 1½–2 ft. long. Leaves long-petioled,

cordate-ovate, deeply crenate, membranous, glabrous, $1\frac{1}{2}$ –2 in. long. Inflorescence a terminal racemose panicle above the leaves; branches 5, lax, approximate, the end one 5–6 in. long; central whorls 6-flowered; pedicels longer than the calyx. Fruit-calyx $\frac{1}{8}$ in. long; tube campanulate; upper tooth small, ovate; lateral minute, deltoid; lower 2 small cusps. Corolla $\frac{1}{3}$ in. long.

Mozamb. Dist. Zanzibar, *Kirk*!

29. **P. sylvestris**, *Gürke in Engl. Jahrb.* xix. 205. Stems branched, 6–7 ft. long, glabrescent below, pubescent above. Leaves petioled, broadly ovate, membranous, $1\frac{1}{2}$ –2 in. long, narrowed to the base, acuminate, deeply toothed, glabrous on both sides or obscurely hairy on the ribs below. Inflorescence a racemose lax panicle; lower whorls remote; cymes 4–6-flowered, sessile; bracts lanceolate or ovate-lanceolate; pedicels $\frac{1}{3}$ – $\frac{1}{2}$ in. long, clothed like the calyx and axis with thick pubescence. Fruit-calyx $\frac{1}{5}$ in. long; upper tooth ovate, acute; lateral lanceolate, acuminate; lower lanceolate, acuminate, as long as the upper. Corolla blue, pubescent; tube very short.

Mozamb. Dist. German East Africa: Kilimanjaro, *Volkens*, 765.

30. **P. punctatus**, *L'Herit. Stirp.* 87, t. 42; *Benth. in DC. Prod.* xii. 64. An erect perennial, with stout simple or branched pubescent stems 1–2 ft. long. Leaves petioled, ovate, crenate, membranous, slightly pubescent, the lower 3–4 in. long, the upper growing gradually smaller. Inflorescence racemose; branches short, dense in the upper half, lax downwards; rhachis very pubescent; whorls many-flowered; pedicels short. Calyx pubescent, $\frac{1}{8}$ – $\frac{1}{6}$ in. long; tube campanulate; upper lip ovate, mucronate, as long as the tube; 4 lower deltoid or lanceolate. Corolla $\frac{1}{4}$ in. long.—*Engl. Hochgebirgsfl. Trop. Afr.* 359.

Nile Land. Abyssinia: Begemeder: Gunnia, 6500 ft., *Schimper*, 312 of 1862 collection; Gatat, 8400 ft., *Schimper*, 312 of 1863 collection, and without precise locality, *Schimper*, 691! and cultivated specimens!

31. **P. kamerunensis**, *Gürke in Engl. Jahrb.* xix. 202. Stems branched, 3–4 ft. long; branchlets pubescent. Leaves with a very long petiole, membranous, round-ovate, the lowest 4 in. long and broad, cordate at the base, acuminate, deeply crenate, with a few adpressed hairs on both sides. Inflorescence a racemose panicle; whorls remote, 6-flowered; cymes sessile or nearly so; pedicels long; bracts ovate, acute. Calyx clothed outside with long hairs, in flower $\frac{1}{8}$ in. long, very accrescent; upper tooth broader, ovate-deltoid, acute; the others shorter, subequal, deltoid, acuminate. Corolla violet.

Upper Guinea. Cameroons: near West Buea, 3200 ft., *Preuss*, 1039.

32. **P. Mannii**, *Baker*. An erect herb, with slender fragile branched pilose stems 6–8 ft. long. Leaves long-petioled, cordate-

ovate, deeply crenate, membranous, slightly hairy, the lower 2-3 in. long. Inflorescence a very lax racemose panicle; branches 3-5, the end one 6-9 in. long; central whorls 6-8-flowered; pedicels long, pubescent. Fruit-calyx $\frac{1}{4}$ in. long; tube oblong; upper tooth small, ovate, with decurrent edges; lateral deltoid-cuspidate; lower 2 lanceolate, cuspidate. Corolla $\frac{1}{3}$ - $\frac{1}{2}$ in. long; lower lip as long as the tube.

Upper Guinea. Cameroons: Cameroon Mountain, 3000 ft., *Mann*, 1947!

33. **P. rupestris**, *Baker*. Stems with a shrubby base, densely hairy. Leaves distinctly petioled, cordate-ovate, membranous, deeply crenate, densely pubescent, $1\frac{1}{2}$ -2 in. long. Inflorescence racemose, lax, terminal, 3-5 in. long; whorls many-flowered; rhachis and pedicels densely pubescent, the latter longer than the calyx; bracts minute, deciduous. Calyx $\frac{1}{8}$ - $\frac{1}{6}$ in. long, pubescent; tube campanulate; upper tooth ovate, as long as the tube; lateral and lower large, lanceolate. Corolla twice as long as the calyx.—*Coleus rupestris*, Hochst. in Schimp. Pl. Abyss. No. 2172.

Nile Land. Abyssinia: near Bellaka, 5000-7000 ft., *Schimper*, 2172! Somaliland: Ahl Mountains, near Maid, 3500 ft., *Hildebrandt*, 1430! and cultivated specimen!

Near *P. madagascariensis*, Benth.

34. **P. quadridentatus**, *Schweinf.* Pl. Abyss. Sept. Exsicc, No. 2086. A perennial herb, with slender branched pubescent stems, decumbent at the base, 3-4 in. long. Leaves shortly petioled, ovate, very small ($\frac{1}{4}$ in. long), obtuse, dentate, cuneate at the base, thick and fleshy, densely pilose on both surfaces. Inflorescence short, lax, racemose; whorls 8-9-flowered; bracts oblong, foliaceous; pedicels $\frac{1}{4}$ - $\frac{1}{3}$ in. long. Fruit-calyx pilose, $\frac{1}{8}$ in. long; tube campanulate; upper tooth ovate, obtuse, as long as the tube; lateral deltoid-cuspidate; lower lanceolate. Corolla not seen.

Nile Land. Eritrea; Mount Alam Kale, north-west of Aidereso, *Schweinfurth* & *Riva*, 2086!

Also in Arabia.

35. **P. cyaneus**, *Gürke in Engl. Jahrb.* xix. 208. Stems erect, branched, pubescent below, subtomentose above. Leaves petioled, thick, broadly ovate, $1\frac{1}{2}$ -2 in. long, obtuse, rounded or subcordate at the base, deeply crenate, subtomentose on both surfaces. Lower whorls remote, 8-10-flowered; cymes sessile; bracts ovate; pedicels $\frac{1}{8}$ - $\frac{1}{4}$ in. long, clothed like the axis and calyx with long spreading hairs. Fruit-calyx $\frac{1}{12}$ - $\frac{1}{10}$ in. long, dotted with yellow glands; upper tooth broadly ovate, acute, with the margins scarcely decurrent; lateral teeth lanceolate-deltoid, acuminate; lower longer, lanceolate-subulate. Corolla blue, dotted with yellow glands.

Mozamb. Dist. German East Africa: Usambara; Silvi near Masheua, 1660 ft., *Holst*, 8850! near Kwa Mshuza in the Handei Mountains, 5000 ft., *Holst*, 8984!

36. **P. sphærophyllus**, *Baker*. Stem slender, simple, thinly hairy. Leaves long-petioled, cordate-orbicular, with 3–4 broad deep teeth on each side, membranous, glabrous, the lower 1–1¼ in. long and broad. Panicle racemose, very lax, terminal, ½ ft. long; central whorls 3–4-flowered; pedicels reaching ¼–½ in. long. Fruit-calyx ⅓ in. long, glabrous; tube campanulate; upper tooth ovate, as long as the tube; 2 lateral short cusps; 2 lower longer cusps. Corolla ½ in. long; lower lip oblong-navicular, rather shorter than the tube.

Mozamb. Dist. Zanzibar? *Kirk!* German East Africa: Usaramo; Dar-es-Salaam, *Kirk!*

37. **P. microphyllus**, *Baker*. Perennial, with slender erect simple firm obscurely pubescent stems, 1 ft. long. Leaves small, distinctly petioled, orbicular, crenate, cuneate and entire at the base, membranous, slightly pubescent. Inflorescence racemose, long, very lax; whorls many-flowered; pedicels as long as the calyx. Fruit-calyx ⅙ in. long; tube campanulate; upper tooth ovate, as long as the tube; lower longer, lanceolate. Corolla ⅓ in. long.

Mozamb. Dist. German East Africa: Usambara; Magila, 1000 ft., *Kirk!*

38. **P. paucicrenatus**, *Franchet, Sert. Somal.* 56. Stems herbaceous, clothed with white hairs. Leaves petioled, suborbicular, deeply inciso-crenate, with only 2–3 teeth on each side, laxly lanate, whitish beneath. Inflorescence a lax racemose panicle; bracts deciduous. Calyx minutely pubescent, as long as the pedicel; upper tooth ovate; 4 lower acute. Corolla ⅓ in. long, scarcely twice the length of the calyx, pubescent.

Nile Land. Somaliland, *Reroil*.

Nearly allied to *P. madagascariensis*, Benth., which, as it occurs in Arabia Felix, Mauritius and Natal, will most likely be found in Tropical Africa.

39. **P. herbaceus**, *Briquet in Engl. Jahrb.* xix. 179. An erect annual, with branched fragile glabrous stems 1–3 ft. long. Leaves shortly petioled, ovate, membranous, crenate, 1–2 in. long, glabrous above, obscurely pubescent beneath. Panicles terminal on the main stem and branches, made up of many ascending forked scorpioid elongated cymes; pedicels very short. Fruit-calyx glabrous, ⅙ in. long; tube campanulate; upper lip orbicular; lateral small, deltoid; lower lanceolate, as long as the upper. Corolla twice as long as the calyx.—*Germanea herbacea*, Hiern, *Cat. Afr. Pl. Welw.* i. 861.

Lower Guinea. Angola: province of Huilla, at Lopollo, *Welwitsch*, 5506! 5614.

40. **P. bongensis**, *Baker*. An annual herb, with slender erect branched glabrous stems 2–3 ft. long. Leaves oblong, acute, petioled, crenate, membranous, glabrous, the lower 2–3 in. long. Inflorescence a lax narrow panicle 6–9 in. long; cymes short, compound; pedicels short. Calyx ⅓ in. long; tube campanulate; lateral lobes oblong;

lower small cusps. Corolla $\frac{1}{3}$ in. long; cylindrical portion of the tube longer than the calyx.

Nile Land. British East Africa: Bongo; Gir, Schweinfurth, 2490!

41. **P. glandulosus**, Hook. f. in Journ. Linn. Soc. vi. 17, vii. 210. A much-branched erect herb, 8–10 ft. high, with slender pilose branchlets. Leaves long-petioled, cordate-ovate, acute, deeply crenate, membranous, glabrous, the lower 4–5 in. long and nearly as broad. Inflorescence an ample, decomposed, terminal panicle; lower branches bracteated at the base by large leaves; branchlets slender, glandular-pubescent; lower whorls of the branchlets of few-flowered peduncled cymes; pedicels longer than the calyx. Flower-calyx $\frac{1}{16}$ – $\frac{1}{12}$ in. long; tube very short; upper tooth large, ovate; lower smaller, ovate; fruit-calyx $\frac{1}{4}$ in. long; lower teeth large cusps. Corolla $\frac{1}{2}$ in. long; lower lip nearly as long as the tube.

Upper Guinea. Cameroons: Cameroon Mountain, 7000 ft., Mann, 2029! Fernando Po, 7000 ft., Mann, 318!

42. **P. elegans**, Britten in Trans. Linn. Soc. ser. 2, Bot. iv. 36. Stem erect, perennial, hairy. Leaves shortly petioled, ovate, 1–2 in. long, acute, cuneate at the base, crenate, scabrous and dark green above, pubescent beneath, with prominent veins. Cymes shortly peduncled, 2–3-flowered, forming a long narrow panicle; pedicels $\frac{1}{6}$ in. long; bracts small, ovate, acute. Calyx minutely hairy, broadly campanulate, $\frac{1}{12}$ in. long; upper tooth ovate, obtuse, the others acuminate. Corolla 3–4 lin. long. Stamens exserted.

Mozamb. Dist. British Central Africa: Nyasaland: Mount Mlanje, Whyte.

43. **P. parvus**, Oliv. in Trans. Linn. Soc. ser. 2, Bot. ii. 347. An erect annual, with the habit of *Circea alpina*, with slender fragile simple or branched hairy stems $\frac{1}{2}$ ft. long. Leaves long-petioled, ovate, acute, membranous, crenate, hairy, 1–1 $\frac{1}{2}$ in. long. Inflorescence racemose, short; lower cymes compound, few-flowered; pedicels longer than the calyx. Flower-calyx $\frac{1}{8}$ in. long; upper tooth short, ovate; lower small, acute. Corolla $\frac{1}{3}$ in. long.

Mozamb. Dist. German East Africa: Kilimanjaro, 5000 ft., Johnston!

44. **P. Johnstonii**, Baker. An erect herb, with slender pilose branchlets. Leaves long-petioled, cordate-ovate, acute, crenate, membranous, slightly pubescent, the lower 2–3 in. long. Panicle small, racemose, short; cymes few-flowered, shortly peduncled; branchlets very slender, densely pubescent; pedicels long or short. Flower-calyx $\frac{1}{8}$ in. long; tube campanulate, pubescent; upper tooth ovate; lower as long, lanceolate. Corolla mauve-lilac, $\frac{1}{2}$ in. long; lower lip oblong, deeply concave, as long as the tube.

Mozamb. Dist. German East Africa: Kilimanjaro, 6000 ft., Johnston, 69!

45. **P. pratensis**, Gürke in Engl. Jahrb. xix. 201. Stems nearly 2 ft. long, erect, branched, pubescent or subtomentose. Leaves long-

petioled, ovate, acute or acuminate, membranous, serrate, 2–3 in. long, $1\frac{1}{2}$ –2 in. broad, rounded or subcordate at the base, clothed with long adpressed hairs on both sides. Inflorescence racemose, very short, terminal; cymes shortly peduncled, crowded, 3-flowered; pedicels $\frac{1}{8}$ – $\frac{1}{6}$ in. long; bracts lanceolate. Calyx shortly tubular, finally $\frac{1}{8}$ – $\frac{1}{6}$ in. long; upper tooth ovate, acute, the others lanceolate-deltoid, acuminate. Corolla with a blue tube and white lips.

Mozamb. Dist. German East Africa: Kilimanjaro, near Marangu, 5000 ft., *Volkens*, 634. Usambara; near Mlalo, *Holst*, 459.

46. ***P. urticoides*, Baker.** An erect herb, with slender stems thinly clothed with spreading white hairs. Leaves long-petioled, cordate-ovate, deeply crenate, membranous, slightly hairy on the main veins, the lower 3–4 in. long and broad, with an ascending petiole nearly as long as the blade. Inflorescence a very lax terminal racemose panicle; cymes simple or slightly compound; pedicels longer than the calyx. Flower-calyx $\frac{1}{6}$ in. long; tube campanulate; upper tooth ovate; 4 lower cuspidate. Corolla $\frac{1}{3}$ in. long.—*P. laxiflorus*, var. *genuinus*, Briquet in Engl. Jahrb. xix. 180, vix Benth. *Germanea laxiflora*, var. *genuina*, Hiern, Cat. Afr. Pl. Welw. i. 861.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5545!

Briquet in Engl. Jahrb. xix. 180, refers this to the South-east African *P. laxiflorus*, Benth., which differs by having many distinctly peduncled cymes, larger corollas, &c. He describes a var. *stenodontus* collected in Angola by Von Mechow.

47. ***P. chiradzulensis*, Baker.** Stem elongated, woody, bearing small distant lateral panicles; branchlets pubescent. Leaves small, petioled, ovate, deeply crenate, membranous, glabrous. Panicles very lax, lateral and terminal; cymes few-flowered, simple or compound; pedicels $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Calyx finally $\frac{1}{4}$ – $\frac{1}{3}$ in. long; upper tooth ovate, shorter than the oblong tube; lateral teeth lanceolate; lower linear, as long as the top one. Corolla $\frac{1}{2}$ in. long; lower lip oblong, deeply concave, as long as the tube.

Mozamb. Dist. British Central Africa: summit of Mount Chiradzulu, *Meller*! Mount Mlanje, 6000 ft., *Whyte*!

48. ***P. usambarensis*, Gürke in Engl. Jahrb. xix. 207.** Stems branched, clothed with spreading glandular hairs. Leaves long-petioled, rhomboid-ovate, membranous, 1– $1\frac{1}{2}$ in. long, at most 1 in. broad, acute, rounded or narrowed to the base, serrate, sparsely clothed on both sides with very long hairs. Inflorescence racemose, lax; whorls remote; cymes 2-flowered, shortly peduncled; bracts ovate-lanceolate, persistent; pedicels $\frac{1}{3}$ in. long, clothed, like the calyx, with long simple and short glandular hairs. Fruit-calyx $\frac{1}{5}$ in. long; upper tooth broad deltoid, acute; lateral deltoid, acuminate; lower longer, lanceolate, acuminate.

Mozamb. Dist. German East Africa: Usambara, *Holst*, 487.

49. **P. albus**, Gürke in *Engl. Jahrb.* xix. 202. Stems branched, 9-10 ft. long; branchlets pubescent or subtomentose. Leaves membranous, distinctly petioled, 2-2½ in. long, ovate, cordate or rounded at the base, acute, crenate, pubescent on both sides. Inflorescence a racemose panicle; whorls remote, 6-flowered; cymes distinctly peduncled; pedicels $\frac{1}{8}$ - $\frac{1}{5}$ in. long; bracts ovate, acute. Fruit-calyx $\frac{1}{8}$ - $\frac{1}{5}$ in. long, declinate, pubescent; upper tooth broader, deltoid-ovate, acute, the others shorter, subequal, deltoid, acute or acuminate. Corolla white, finely pubescent.

Mozamb. Dist. German East Africa: Kilimanjaro, 5000-6000 ft., *Volkens*, 744.

Near *P. laxiflorus*, Benth.

50. **P. violaceus**, Gürke in *Engl. Jahrb.* xix. 201. Stems erect, branched, 6-7 ft. long; branchlets glandular-pubescent. Leaves membranous, long-petioled, ovate, the lower 5-6 in. long, 3-4 in. broad, acute or acuminate, rounded at the base, strongly crenate, glabrous on both sides. Inflorescence a lax racemose panicle; cymes distinctly peduncled; whorls 6-flowered; pedicels $\frac{1}{8}$ - $\frac{1}{5}$ in. long; bracts small, oblong-lanceolate. Fruit-calyx $\frac{1}{8}$ in. long, declinate, glandular-pubescent; upper tooth largest, ovate-deltoid, acute, the others rather shorter, deltoid, acute, subequal. Corolla violet.

Mozamb. Dist. German East Africa: Usambara: Lutindi, 5000 ft., *Holst*, 3317!

Near *P. laxiflorus*, Benth.

51. **P. hylophilus**, Gürke in *Engl. Jahrb.* xix. 203. Stems branched, 6-7 ft. long; branchlets glandular-pubescent. Leaves long-petioled, membranous, ovate, the lower 4 in. long, 3 in. broad, cordate or subcordate at the base, acuminate, deeply serrate, both sides sparsely clothed with adpressed hairs. Inflorescence a lax racemose panicle; cymes 3-flowered, distinctly peduncled; bracts lanceolate, acuminate; pedicels $\frac{1}{3}$ in. long, glandular-pubescent, as are the calyx and rhachis. Calyx very accrescent, finally $\frac{1}{3}$ in. long; upper tooth broader, ovate-deltoid, acuminate; lateral shorter, lanceolate, acuminate; lower longer, sub-rigid, subulate. Corolla violet, 4-5 lin. long.

Upper Guinea. Cameroons: near Mann's Spring, 7200 ft., *Preuss*, 815!

52. **P. orbicularis**, Gürke in *Engl. Jahrb.* xix. 203. Stems but little branched, pubescent, 1½ ft. long. Leaves long-petioled, orbicular, membranous, 1-2 in. long and broad, obtuse or cuspidate, deeply cordate at the base, deeply toothed, glabrous, gland-dotted beneath. Inflorescence racemose, lax; whorls distant, 6-flowered; cymes shortly peduncled; bracts round or broadly ovate; pedicels $\frac{1}{3}$ in. long, shortly pubescent, as are the calyx and axis. Fruit-calyx $\frac{1}{3}$ in. long; upper tooth broadly ovate, cuspidate; lateral teeth deltoid, acuminate; lower lanceolate-deltoid, acuminate, longer than the upper. Corolla declinate.

Mozamb. Dist. Zanzibar, *Stuhlmann*, 826. German East Africa: Usambara: Upanga Swamp, *Holst*, 4159.

53. **P. schizophyllus**, *Baker*. An erect perennial, with slender branched pubescent stems. Leaves shortly petioled, rhomboid, 1–1½ in. long, deeply cut from the margins and apex into linear lobes with revolute edges, cuneate at the base, moderately firm, thinly pilose on the upper surfaces, pubescent beneath. Inflorescence racemose, long, lax; lower whorls 6–8-flowered, not strictly umbellate; pedicels $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Fruit-calyx $\frac{1}{6}$ in. long, slightly pilose; tube very short; upper tooth ovate, obtuse, longer than the tube; lateral short, obtuse; lower lanceolate, much longer. Corolla not seen.

Mozamb. Dist. British Central Africa: Nyasaland; between Kondowe and Karonga, west side of Lake Nyasa, 2000–6000 ft., *Whyte*, 376!

54. **P. lycopifolius**, *A. Rich. Tent. Fl. Abyss. ii.* 181. Stem herbaceous; branches erect, hairy. Leaves sessile, ovate-oblong, acute, serrate, subscabrous above, hairy on the ribs below. Inflorescence racemose, elongated; whorls spread out, many-flowered. Calyx campanulate, clothed with glandular hairs; teeth lanceolate, the upper rather broader. Corolla small.

Nile Land. Abyssinia: Tigre; near Adowa, *Quartin-Dillon*.

55. **P. moschosmoides**, *Baker*. A shrubby perennial, with stems finely pubescent upwards. Leaves at the base of the panicle small, sessile, ovate, entire, pubescent. Panicle 1 ft. long, composed of about 30 dense cylindrical racemes, usually ternate on short branches, the end ones 2–3 in. long; pedicels short; bracts ovate, very small. Flower-calyx $\frac{1}{8}$ in. long, densely clothed with white hairs; tube campanulate; teeth ovate, subequal, shorter than the tube. Corolla twice as long as the calyx.—*Germanea cylindracea*, *Hiern, Cat. Afr. Pl. Welw. i.* 861.

Lower Guinea. Angola: Huilla, *Welwitsch*, 5489!

56. **P. cylindraceus**, *Hochst.; Benth. in DC. Prod. xii.* 60. A shrubby perennial, with stems shortly pubescent upwards. Leaves shortly petioled, oblong, crenate, pubescent on both sides, cuneate and entire at the base. Inflorescence racemose, dense in the upper half, 3–5 in. long, 1–3 to a stem; pedicels often longer than the calyx; bracts small, ovate, acute, very pubescent. Flower-calyx $\frac{1}{8}$ in. long, densely clothed with white pubescence; tube campanulate; teeth deltoid, subequal. Corolla pubescent, twice as long as the calyx.—*A. Rich. Tent. Fl. Abyss. ii.* 183; *Engl. Hochgebirgsfl. Trop. Afr.* 358.

Nile Land. Eritrea: Aidereso, 4000 ft., *Schweinfurth & Riva*, 1700! Mount Alam Kale to the north-west of Aidereso, *Schweinfurth & Riva*, 1806! Abyssinia: Tigre: Adowa, *Quartin-Dillon & Petit*, and near Mai Gouagoua, *Quartin-Dillon*, 420! Mettgalo, *Schimper*, 705; Samen: on rocks near Gapdia, *Schimper*, 1113! province of Shoa, *Petit*.

Also in Arabia.

57. **P. marrubioides**, *Hochst.; Benth. in DC. Prod. xii.* 60. A shrubby perennial, with finely pubescent stems. Leaves small, sessile,

pubescent, oblong, crenate, with an entire cuneate base. Branches of the panicle laxer than in *P. cylindraceus*, the end one 5–6 in. long, one or few to a stem; flowers in dense globose whorls; pedicels very short; bracts small, ovate, pubescent. Flower-calyx $\frac{1}{2}$ in. long, densely clothed with short white hairs; tube campanulate; teeth subequal, short, deltoid. Corolla hairy, twice as long as the calyx.—A. Rich. Tent. Fl. Abyss. ii. 181; Schweinf. Beitr. Fl. Aethiop. 127; Engl. Hochgebirgsfl. Trop. Afr. 358.

Nile Land. Abyssinia: Samen; near Jaja (Dschadscha), 6000 ft., *Schimper*, 387, and without precise locality, *Schimper*, 146! 1925!

58. **P. sanguineus**, *Britten in Trans. Linn. Soc. Bot. ser. 2, Bot. iv. 36.* A shrub with pubescent woody branches. Leaves developed after the flowers, only seen in a young state, subsessile, orbicular, with a cuneate base, crenate, pubescent. Inflorescence a very dense short terminal racemose panicle; rhachis densely hispid; whorls many-flowered, simple; pedicels very short. Calyx campanulate, $\frac{1}{8}$ in. long, densely hairy, exuding (like the bud-scales, corolla and stamens) bright red resinous drops; teeth lanceolate, subequal, as long as the tube. Corolla $\frac{1}{3}$ in. long; lower lip as long as the tube.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, 6000 ft., *Whyte!*

59. **P. primulinus**, *Baker in Kew Bulletin, 1895, 292.* Stems perennial; branches long, softly woody. Leaves unknown. Inflorescence a short very dense oblong racemose panicle $1\frac{1}{2}$ –2 in. long; cymes sessile; pedicels very short. Calyx finally $\frac{1}{6}$ in. long, densely pilose; tube campanulate; teeth linear, equal, longer than the tube. Corolla pale yellow, pilose, $\frac{1}{4}$ in. long; tube rather longer than the calyx. Stamens reaching the tip of the lower lip of the corolla.

Mozamb. Dist. British Central Africa: Moero Plateau, south-west of Lake Tanganyika, *Carson*, 36!

60. **P. densus**, *N. E. Brown in Kew Bulletin, 1894, 12.* An under-shrub, with erect woody pubescent branches. Leaves unknown. Inflorescence a racemose panicle; branches dense, 1– $1\frac{1}{2}$ in. long; bracts obovate or oblanceolate, $\frac{1}{8}$ – $\frac{1}{6}$ in. long, twice as long as the pedicels. Calyx 2– $2\frac{1}{2}$ lin. long, with 5 subequal lanceolate acuminate teeth. Corolla 5 lin. long.

Mozamb. Dist. German East Africa: Higher Plateaux north of Lake Nyasa, *Thomson!*

61. **P. stenosphon**, *Baker.* An annual, with erect simple slender glabrous stems 1– $1\frac{1}{2}$ ft. long. Leaves long-petioled, membranous, ovate, crenate, obscurely pubescent, 2–3 in. long; petiole longer than the blade. Inflorescence racemose, moderately dense, 3–4 in. long; flowers 5–6 in a whorl; bracts minute; pedicels short, pubescent. Calyx pubescent, $\frac{1}{6}$ – $\frac{1}{2}$ in. long; tube campanulate; teeth ovate-

lanceolate, subequal. Corolla $\frac{1}{2}$ in. long; tube very slender, three times the length of the calyx.

Mozamb. Dist. British Central Africa: Nyasaland; near the River Shire, *Kirk!* Zambesi (?), *Kirk!*

62. **P. betonicæfolius**, *Baker in Kew Bulletin*, 1895, 72. Stem herbaceous, perennial, 2–3 ft. long; branchlets clothed with white down. Leaves distinctly petioled, ovate, the lower $1\frac{1}{2}$ –2 in. long, crenate, green on the face, clothed with white pubescence beneath. Peduncle long, naked. Inflorescence a dense simple cylindrical racemose panicle, 3 in. long; axis densely pilose; bracts ovate, cuspidate. Calyx $\frac{1}{2}$ in. long, densely clothed with purple woolly hairs; teeth subequal, deltoid. Corolla pubescent, 6–7 lin. long; tube much longer than the calyx, dilated in the upper half; upper lip small; lower large, very concave. Stamens included.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, south of Lake Tanganyika, 5000 ft., *Carson*, 64, 79! *Nutt!*

63. **P. horridus**, *Baker*. A coarse herb, with the habit of *Urtica dioica*. Stems erect, simple, with spreading white bristly hairs. Leaves ovate, membranous, pubescent, deeply crenate, 2–3 in. long; petiole long, clothed with bristles like those of the stem. Inflorescence racemose, lax, simple, 3–4 in. long; flowers about six in a whorl; rhachis coarsely pubescent; pedicels unequal, some longer than the calyx. Calyx $\frac{1}{2}$ – $\frac{1}{8}$ in. long; teeth ovate-lanceolate, subequal. Corolla $\frac{1}{3}$ in. long; tube scarcely longer than the calyx.—*Germanea horrida*, *Hiern*, *Cat. Afr. Pl. Welw.* i. 863.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5537! 5613!

64. **P. pubescens**, *Baker*. An erect perennial, with branched densely pubescent stems. Leaves distinctly petioled, broadly ovate, about 1 in. long, acute, shallowly cordate at the base, deeply crenate, membranous, green and densely pubescent on both surfaces. Whorls lax, arranged in a long racemose panicle; bracts minute; pedicels pubescent, $\frac{1}{8}$ in. long. Fruit-calyx pubescent, $\frac{1}{6}$ in. long; teeth small, subequal, deltoid or lanceolate-deltoid. Corolla $\frac{1}{2}$ in. long. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Malosa, 4000–6000 ft., *Whyte!* Nyika Plateau, 7000 ft., *Whyte!*

65. **P. nyikensis**, *Baker*. A much-branched undershrub, with woody pubescent branches. Leaves shortly petioled, broadly ovate or suborbicular, $\frac{3}{4}$ –1 in. long, obtuse, broadly rounded at the base, firm, green and pubescent on both surfaces. Cymes few-flowered, umbellate, arranged in a moderately long lax racemose panicle; bracts small, ovate, foliaceous; pedicels densely pubescent, $\frac{1}{6}$ in. long. Calyx densely

pubescent, $\frac{1}{6}$ in. long; tube campanulate; teeth small, deltoid, subequal. Corolla $\frac{1}{2}$ in. long. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland: Nyika Plateau, 6000–7000 ft., *Whyte*, 162!

66. **P. triflorus**, *Baker*. A perennial herb, with short slender erect densely pubescent stems. Leaves small, shortly petioled, cordate-ovate, crenate, densely pubescent. Panicles racemose, very lax; branches short, generally three-flowered; pedicels short, like the peduncles densely pubescent. Calyx $\frac{1}{8}$ in. long, densely pubescent; tube campanulate; teeth small, ovate; lower pair longest. Corolla $\frac{1}{3}$ in. long; tube much curved, 2–3 times the length of the calyx.

Mozamb. Dist. German East Africa: Kilimanjaro, 9000–10,000 ft., *Thomson*!

67. **P. matabelensis**, *Baker*. Annual? Stem square, fragile, slender, erect, glabrous. Leaves distinctly petioled, cordate-ovate, membranous, deeply crenate, 2–3 in. long. Panicle 6–9 in. long, with short ascending branches, bearing several flowers crowded at the top. Calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long; teeth subequal, ovate-lanceolate, shorter than the oblong tube. Corolla $\frac{1}{2}$ in. long; tube 2–3 times the length of the calyx.

Mozamb. Dist. Matabeleland: by the Rocky Shasha River, *Holub*, 1403–1406!

68. **P. defoliatus**, *Hochst.*; *Benth. in DC. Prod.* xii. 60. A shrub, with woody dense pubescent branches. Leaves not seen, not produced with the flowers, small, orbicular. Panicle racemose, long, lax; branches several in a whorl; rhachises pubescent; cymes irregular; pedicels short, pubescent; bracts minute. Calyx campanulate, densely pilose, $\frac{1}{8}$ in. long; teeth subequal, lanceolate, as long as the tube. Corolla $\frac{1}{2}$ in. long; lower lip as long as the tube.—*A. Rich. Tent. Fl. Abyss.* ii. 181; *Engl. Hochgebirgsfl. Trop. Afr.* 358.

Nile Land. Abyssinia: Samen; Woina Deka Region, *Steudner*, 1412! on the sides of mountains near Jomara, *Schimper*, 847! province of Wojerat, *Petit*.

Lower Guinea. Angola: near the River Cunene, *Johnston*!

69. **P. kondowensis**, *Baker*. An erect, branched, perennial herb, with slender finely pubescent stems. Leaves long-petioled, cordate, ovate, 2–3 $\frac{1}{2}$ in. long, acute, crenate, membranous, green and finely pubescent on both surfaces. Cymes usually 3-flowered, distinctly peduncled, on a lax terminal panicle; lower bracts ovate, foliaceous; pedicels pubescent, $\frac{1}{6}$ – $\frac{1}{4}$ in. long. Fruit-calyx pubescent, $\frac{1}{6}$ in. long; tube campanulate; teeth minute, upper deltoid, lower deltoid-cuspidate. Corolla $\frac{3}{4}$ in. long; tube dilated in the upper half; lower lip large. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland: between Kondowe and Karonga, west of Lake Nyasa, 2000–6000 ft., *Whyte*!

70. **P. Zenkeri**, *Gürke in Engl. Jahrb.* xix. 199. Stems erect, branched, pubescent. Leaves distinctly petioled, membranous, ovate or ovate-oblong, above 1 in. long, rounded at the base, acute or acuminate, crenate, glabrous above, pubescent below. Racemes lax, compound; cymes remote, 3-flowered, with a peduncle $\frac{1}{2}$ in. long; pedicels long, sparsely glandular-pubescent, like the calyx and rhachis; bracts ovate or ovate-lanceolate. Calyx tubular, in flower $\frac{1}{12}$ in., finally $\frac{1}{3}$ in. long; teeth subequal, lanceolate-deltoid, acuminate, lower shorter. Corolla lilac.

Upper Guinea. Cameroons: near Yaunde, *Zenker*.

71. **P. Schimperii**, *Vatke in Linnæa*, xxxvii. 317. An annual, with much-branched slender fragile glabrous stems 2–3 ft. long. Leaves distinctly petioled, ovate, acute, membranous, crenate, slightly hairy, 1–2 in. long. Inflorescence a lax terminal panicle, with compound cymes on slender ascending peduncles from the axils of the upper leaves; pedicels pubescent, long or short. Flower-calyx pubescent, $\frac{1}{8}$ in. long; teeth ovate, equal, shorter than the tube. Corolla-tube twice as long as the calyx; lips $\frac{1}{6}$ in. long.—*Engl. Hochgebirgsfl. Trop. Afr.* 358.

Nile Land. Abyssinia: Begemeder; near Gafat, by streams, in hedges and at the foot of mountains, 8100–8200 ft., *Schimper*, 1174! 1179! and without precise locality, *Roth*, 502!

72. **P. ramosissimus**, *Hook. f. in Journ. Linn. Soc.* vi. 17, vii. 210. An erect, much-branched herb, 4–10 ft. high, with square slightly pubescent stems. Leaves distinctly petioled, narrowly ovate, crenate, small, pubescent. Inflorescence a lax panicle terminating each branch, with copiously compound branchlets, each subtended at the base by a reduced leaf; pedicels pubescent. Flower-calyx $\frac{1}{12}$ in. long, densely pubescent; tube campanulate; teeth small, deltoid, subequal. Corolla $\frac{1}{6}$ in. long; tube straight, funnel-shaped, twice as long as the calyx; lower lip much smaller in proportion than usual in the genus. Stamens exserted beyond the lower lip.—*Engl. Hochgebirgsfl. Trop. Afr.* 359.

Upper Guinea. Cameroons: Cameroon Mountain, 3000–7000 ft., *Mann*, 1320! 1996! *Johnston*, 102! Fernando Po: Clarence Peak, 5000 ft., *Mann*, 624!

73. **P. hoslundioides**, *Baker*. A much-branched herb, with finely hairy slender fragile stems. Leaves shortly petioled, broadly ovate, crenate, small, pubescent, especially beneath. Inflorescence a lax panicle with trichotomously cymose forks at the end of each branch; pedicels long, very slender. Flower-calyx densely pubescent, $\frac{1}{18}$ in. long; teeth ovate, subequal. Corolla $\frac{1}{4}$ in. long; tube straight, sub-cylindrical, three times the length of the calyx; lower lip much smaller than is usual in the genus. Stamens shortly exserted.

Mozamb. Dist. German East Africa: Lower Plateau, north of Lake Nyasa, *Thomson*!

Nearly allied to *P. ramosissimus*, *Hook. f.*

74. **P. Whytei**, *Baker*. A much-branched, erect perennial herb, with slender branches, densely clothed upwards with short hairs. Leaves sessile, ovate, 1–2 in. long, acute, crenate, broadly rounded at the base, moderately firm, green and thinly pilose above, densely pilose beneath. Cymes not umbellate, produced on long slender peduncles from the axils of large leaves; pedicels long. Calyx finally $\frac{1}{6}$ in. long, densely pilose; tube recurved; teeth small, subequal, deltoid. Corolla $\frac{1}{4}$ in. long; lips small. Stamens not exerted. Style finally exerted.

Mozamb. Dist. British Central Africa: Nyasaland; Tanganyika Plateau at Fort Hill, 3500–4000 ft., *Whyte!* between Mpata and the commencement of the Tanganyika Plateau, 2000–3000 ft., *Whyte!* Masuka Plateau, 6500–7000 ft., *Whyte!* North Nyasa, *Whyte!*

75. **P. paniculatus**, *Baker*. A much-branched, erect perennial herb, with slender branches, clothed with short deflexed hairs. Leaves shortly petioled, ovate, 1–2 in. long, subacute, crenate, rounded at the base, thin, green and pilose on both surfaces. Cymes not umbellate, produced from the axils of large leaves on long slender peduncles; pedicel of central flower $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Fruit-calyx $\frac{1}{6}$ in. long, densely pilose; tube campanulate, teeth small, subequal, deltoid-cuspidate. Corolla $\frac{1}{3}$ in. long; tube cylindric; lips small. Stamens not exerted. Style finally exerted, forked at the tip.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte*, 200! Blantyre, in damp places, *Buchanan*, 105!

76. **P. insolitus**, *C. H. Wright in Journ. Linn. Soc. xxxiv. 275, t. 6, figs. 7–8*. A glabrous herb. Stem erect, slightly woody at the base, striate when dry. Leaves alternate, linear or slightly falcate, acute, attenuate at the base, entire, $1\frac{1}{4}$ in. long, 1 lin. wide. Raceme terminal; bracts alternate, rarely opposite, ovate-lanceolate, shorter than the pedicels. Calyx campanulate, glandular outside; upper lobe entire, broadly ovate; lower lobes narrowly triangular. Corolla-tube contracted near the base, campanulate above; lower lip entire, glandular outside; upper of 4 subequal obtuse teeth. Filaments very shortly connate at the base. Ovary when young deeply 4-lobed.—*Symphostemon insolitus*, *Hiern in Cat. Afr. Pl. Welw. i. 867*.

Lower Guinea. Angola: *Welwitsch*, 1634, 5593!

This species recedes from typical *Plectranthus* in having alternate leaves and very shortly connate filaments. It approaches *Englerastrum*, *Briquet*.

Imperfectly known species.

77. **P. Marquesii**, *Gürke ex Henriques in Bolet. Soc. Brot. xvi. 70*. Stem erect, glabrous. Leaves distinctly petioled, oblong-lanceolate, 5–6 in. long, 2 in. broad, acuminate, narrowed to the base, serrate, glabrous on both surfaces. Racemes lax, 4–5 in. long; whorls distant, 6-flowered; pedicels long. Calyx sparsely, very shortly pilose.

South Central. Muato-lamoo; undershrub in shade along the River Cuillo, *Marques*, 197.

78. **P. Coppini**, *Cornu in Comptes-rendus Acad. Paris*, cxxx. 1268, a species with edible tuberous roots from the Sudan, is at present a doubtful member of the genus.

14. **SOLENOSTEMON**, Schumach. et Thonn.; Benth et Hook. f. Gen. Plant ii. 1175.

Calyx slightly accrescent; tube campanulate in the flowering stage, 10-ribbed; upper tooth ovate, with decurrent edges; lateral small; lower oblong, as long as the upper. Corolla-tube cylindrical, dilated and deflexed at the throat; upper lip shorter; lower long, oblong, deeply concave. Stamens 4, declinate; filaments filiform, united in a tube at the base; anther-cells confluent. Disk glandular, style shortly bifid. Nucules ovoid, smooth.—Erect herbs. Leaves ovate, crenate, long-petioled; whorls of flowers arranged in a long raceme or panicle; bracts small. Flowers small, lilac.

One of the species also Tropical American.

Cymes simple, umbellate.

Annual 1. *S. ocymoides*.

Perennial.

Leaves very small 2. *S. decumbens*.

Leaves not very small 3. *S. calaminthoides*.

Cymes not umbellate.

Stems short.

Leaves membranous, pubescent 4. *S. zambesiacus*.

Leaves firm, glabrous 5. *S. Mannii*.

Stems 10–12 ft. long 6. *S. cymosus*.

1. **S. ocymoides**, Schumach. & Thonn. *Beskr. Guin. Pl.* 271. An annual herb, with erect fragile branched slightly pubescent stems, 3–4 ft. long. Leaves nettle-like, long-petioled, ovate, crenate, membranous, slightly pubescent, the lower 3–4 in. long and broad. Whorls laxly disposed, simple, many-flowered, forming a raceme sometimes 1 ft. long; pedicels pubescent, $\frac{1}{8}$ in. long; bracts as long as the pedicels. Calyx finally $\frac{1}{6}$ in. long; tube short, campanulate; upper lip reflexed, orbicular, longer than the tube; side teeth very small; lower lip oblong, concave. Corolla-tube rather longer than the calyx; lower lip $\frac{1}{4}$ in. long.—Hiern in *Cat. Afr. Pl. Welw.* i. 863. *S. africanus*, Briquet in *Engl. Jahrb.* xix. 181, in obs. *S. ocimoides*, Briquet in *Bull. Soc. Bot. Belg.* xxxvii. 68; Henriques in *Bolet. Soc. Brot.* x. 149.

Upper Guinea. Senegal, without collector's name! Sierra Leone: Heddles Farm, open places in the bush, *Scott-Elliott*, 3908! *Welwitsch*, 5579, 5580! French Guinea, near Salimania, *Scott-Elliott*, 5336! Ashanti, *Cummins*, 9! Lagos: Yoruba district, *Moloney*! Niger Territory: Nupe, *Barter*, 1281! Lower Niger; Stirling Hill, *Ansell*! Cameroons: Rio del Rey, *Johnston*! Batanga, *Bates*, 117! Fernando Po, *Barter*! *Mann*, 404!

Lower Guinea. Island of St. Thomas, *Moller*. Angola: 15 miles from Ambriz, *Monteiro*!

South Central. Congo Free State: Monbuttu; by the Kussumbo River, Schweinfurth, 3633!

Var. *monostachyus*, Baker. Differs from the type by its more broadly ovate and more distinctly crenate leaves, more contiguous whorls of flowers, larger fruit-calyx, and smaller corolla. *S. monostachyus*, Briquet in Bull. Soc. Bot. Belg. xxxvii. 69 and in Engl. & Prantl, Pflanzenfam. iv. 3A, 359. *Ocimum monostachyum*, P. Beauv. Fl. Owar, ii. 60, t. 95, fig. 1. *Plectranthus Palisoti*, Benth. in DC. Prod. xii. 69.

Upper Guinea. Benin, Beauvois. Niger Delta: Grand Bassa, Vogel, 49! Nun River, Vogel, 8!

Lower Guinea. Congo, Dewèvre.

South Central. Congo Free State: Lusambo, on the River Sankuru, Laurent. Also in Bahia.

2. **S. decumbens**, Baker. A perennial herb, with simple pubescent flowering stems, ascending from a decumbent base. Leaves very small, ovate, crenate, distinctly petioled. Whorls simple, 6-8-flowered; pedicels arcuate, longer than the calyx; raceme simple, lax, 2-4 in. long; bracts minute. Calyx finally $\frac{1}{8}$ in. long; tube short, campanulate; upper and lower lips oblong, subequal; side teeth very small. Corolla blue; tube little longer than the calyx; upper lip very short; lower lip longer than the tube. Stamens as long as the lower lip.—*Plectranthus decumbens*, Hook. f. in Journ. Linn. Soc. vii. 210; Engl. Hochgebirgsfl. Trop. Afr. 359.

Upper Guinea. Cameroons: Cameroon Mountain, 7000-8000 ft., Mann, 2002! Johnston, 79!

3. **S. calaminthoides**, Baker. A perennial herb, with slender ascending glabrous stems. Leaves petioled, ovate, crenate, nearly glabrous, 1-1 $\frac{1}{2}$ in. long, cuneate and entire at the base. Raceme lax, simple, terminal, 4-5 in. long; whorls remote, 6-8-flowered; pedicels pubescent, as long as the calyx. Fruit-calyx $\frac{1}{6}$ in. long; tube short, campanulate; upper tooth ovate, reflexed, longer than the tube; side teeth minute; lower lip oblong, concave, as long as the tube. Corolla not seen.

Upper Guinea. Gaboon River, Mann!

4. **S. zambesiacus**, Baker. A perennial herb, with the habit of *Stachys sylvatica*. Stems stout, square, pubescent. Leaves long-petioled, cordate-ovate, crenate, membranous, pubescent or subglabrous, the lower reaching a length of 4-5 in. Panicle moderately dense, narrow, terminal, 6-9 in. long; branches of short corymbose cymes; pedicels long, pubescent. Calyx finally $\frac{1}{6}$ in. long; tube campanulate; upper tooth ovate; lateral minute; lower fused into an oblong lip. Corolla $\frac{1}{3}$ in. long.

Mozamb. Dist. British Central Africa: Nyasaland; Blantyre, Last! between Shibisa and Tshinmuzo, 2000-4000 ft., Kirk!

5. **S. Mannii**, *Baker*. An herbaceous perennial, with erect stems, 3 ft. long, and firm glabrous branches. Leaves petioled, ovate, acute, crenate, cuneate at the base, moderately firm, glabrous, 1–1½ in. long. Inflorescence a lax, cylindrical, peduncled, terminal panicle 3–4 in. long, with slightly compound subsessile cymose branches; pedicels long, slender. Flower-calyx $\frac{1}{2}$ in. long, deeply bilabiate; upper lip ovate, reflexed; lower oblong. Corolla $\frac{1}{2}$ in. long; lower lip longer than the tube.—*Coleus Mannii*, Hook. f. in Journ. Linn. Soc. vii. 211; Engl. Hochgebirgsfl. Trop. Afr. 361.

Upper Guinea. Cameroons: Cameroon Mountain, 5000–6000 ft., *Mann*, 1967!

6. **S. cymosus**, *Baker*. Stems 10–12 ft. long, slender, square, glabrous. Leaves ovate, acute, long-petioled, nearly or quite glabrous, the lower 3–4 in. long. Whorls distant, each composed of two lax cymes, arranged in a panicle reaching a foot in length; pedicels glabrous, $\frac{1}{8}$ – $\frac{1}{4}$ in. long, in fruit up to 5 lin.; bracts minute. Calyx finally $\frac{1}{6}$ in. long; tube campanulate; upper lip orbicular, reflexed; lower oblong, concave. Corolla-tube much longer than the calyx, deflexed and dilated at the throat; lower lip $\frac{1}{4}$ in. long. Stamens as long as the lower lip.

Upper Guinea. Cameroons: Cameroon Mountain, 1000–3000 ft., *Mann*, 1251!

Schweinfurth's No. 3596 from Monbuttu is probably a near ally, but our specimen does not show corolla and stamens.

15. **COLEUS**, Lour.; Benth. et Hook. f. Gen. Plant. ii. 1176.

Calyx usually declinate in fruit; tube campanulate; upper tooth ovate; 4 lower narrower, acute. Corolla-tube much longer than the calyx, deflexed about the middle; throat funnel-shaped; limb bilabiate; lower lip long, oblong, deeply concave. Stamens 4, didynamous, declinate; filaments united in a tube above their insertion in the throat of the corolla; anther-cells confluent. Disk produced into a gland on the lower side of the ovary. Style bifid at the apex. Nucules ovoid or subglobose, smooth.—Annual or perennial herbs or small shrubs. Leaves various in shape, petioled or sessile. Whorls of racemes usually simple, rarely compound. Flowers usually lilac, small or middle-sized.

Species 80–100, spread through the warmer regions of the Old World.

*Cymes umbellate, arranged in a simple racemose panicle.

Leaves sessile or subsessile.

Perennial herbs.

Leaves thin and not at all fleshy.

Root without tubers.

Leaves glabrous 1. *C. aquaticus*.

Leaves pubescent 2. *C. glandulosus*.

- Root bearing tubers 3. *C. edulis*.
 Leaves thick and rather fleshy 4. *C. Kilimandschari*.
 Undershrub with woody branches 5. *C. comosus*.
 Leaves distinctly petioled.
- † Herbs.
- Leaves thin and not at all fleshy.
- Leaves glabrous.
- Root tuberous 6. *C. salagensis*.
 Root not tuberous.
- Whorls many-flowered.
- Corolla red 7. *C. elatus*.
 Corolla lilac 8. *C. ruwenzoriensis*.
 Corolla yellow 9. *C. decurrens*.
 Whorls 2-flowered 10. *C. leptophyllus*.
- Leaves slightly pubescent, not bullate.
- Leaves elliptic or suborbicular.
- Bracts oblong 11. *C. Dupuisii*.
 Bracts ovate 12. *C. Deweyi*.
- Leaves ovate.
- Lower whorls 12-15-flowered 13. *C. assurgens*.
 Lower whorls 8-flowered 14. *C. Penzigii*.
- Leaves pubescent, bullate 15. *C. bullulatus*.
- Leaves very hairy.
- Root bearing small tubers 16. *C. lanuginosus*.
 Root not tuberous.
- Dwarf 17. *C. trichophorus*.
 Not dwarf.
- Fruit-calyx $\frac{1}{8}$ in. long 18. *C. barbatus*.
 Fruit-calyx $\frac{1}{4}$ in. long 19. *C. gomphophyllus*.
- Leaves thicker and more or less fleshy.
- Leaves lanceolate or oblong-lanceolate 20. *C. flavorirens*.
 Leaves oblong or obovate 21. *C. Schinzii*.
 Leaves ovate-rhomboid or ovate-lanceolate 22. *C. decumbens*.
- Leaves ovate.
- Leaves small 23. *C. tetensis*.
 Leaves 1-2 in. long.
- Leaves crenate.
- Whorls 5-6-flowered.
- Corolla-tube as long as the calyx 24. *C. vestitus*.
 Corolla-tube longer than the calyx 25. *C. speciosus*.
 Whorls 6-10-flowered 26. *C. Schweinfurthii*.
 Whorls 12-flowered 27. *C. petersianus*.
 Leaves deeply serrate 28. *C. tricholobus*.
- Leaves 2-4 in. long.
- Pedicels $\frac{1}{5}$ in. long 29. *C. cœruleus*.
 Pedicels $\frac{1}{3}$ - $\frac{1}{2}$ in. long.
- Fruit-calyx $\frac{1}{6}$ in. long 30. *C. Camporum*.
 Fruit-calyx $\frac{1}{4}$ in. long 31. *C. gymnostomum*.
- †† Undershrubs with woody branches.
- Leaves small.
- Leaves cuneate at the base.
- Corolla small 32. *C. Welwitschii*.
 Corolla large 33. *C. cuneatus*.
 Leaves rounded at the base 34. *C. amboinicus*.

Calyx medium-sized ($\frac{1}{8}$ – $\frac{1}{6}$ in. long).

Leaves small.

Lower calyx-teeth small.

Corolla very small 68. *C. etevaldianus*.

Corolla $\frac{1}{3}$ in. long 69. *C. concinnus*.

Lower calyx-teeth large.

Annual 70. *C. tenuicaulis*.

Perennial 71. *C. cunenensis*.

Leaves medium-sized ($1\frac{1}{2}$ –3 in. long).

Leaves glabrescent on both sides 72. *C. viridis*.

Leaves subglabrous above, pubescent below 73. *C. shirensis*.

Leaves pubescent on both sides 74. *C. scandens*.

Leaves glabrous above, pubescent and gland-dotted beneath 75. *C. dissitiflorus*.

Leaves large.

Leaves glabrous 76. *C. Preussii*.

Leaves pubescent 77. *C. punctatus*.

1. **C. aquaticus**, *Gürke in Engl. Jahrb.* xix. 218. A perennial herb, with stems $1\frac{1}{2}$ –2 ft. long, glabrescent below, clothed upwards with long spreading glandular hairs. Leaves shortly petioled or sessile, ovate, membranous, 2–3 in. long, 1 – $1\frac{1}{2}$ in. broad, acute, narrowed to the base, serrate, quite glabrous on both sides. Panicle racemose, simple, terminal; whorls 8–10-flowered, the lower remote; pedicels $\frac{1}{8}$ – $\frac{1}{6}$ in. long, clothed like the axis and calyx with long spreading glandular hairs; bracts ovate, acute. Flower-calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long; upper tooth ovate-lanceolate, acute; edges not decurrent; lateral rather shorter, lanceolate, acute; lowest as long as the upper, lanceolate, acuminate.

Mozamb. Dist. German East Africa: Kilimanjaro, 5000–7500 ft., *Volkens*, 583, 860.

2. **C. glandulosus**, *Hook. f. in Journ. Linn. Soc.* vii. 211. A branched herb, with erect pubescent slender stems 5–6 ft. long. Leaves sessile or nearly sessile, ovate, crenate, pubescent, not at all fleshy, densely gland-dotted, 1 – $1\frac{1}{2}$ in. long. Panicles racemose, of few distant many-flowered globose whorls; bracts small, foliaceous; pedicels short. Fruit-calyx $\frac{1}{4}$ in. long, pilose; upper tooth ovate; 4 lower narrow, acute. Corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long; lips nearly or quite as long as the tube.—*Engl. Hochgebirgsfl. Trop. Afr.* 361.

Upper Guinea. Cameroons: Cameroon Mountain, 2500–7000 ft., *Mann*, 1301! 1988!

3. **C. edulis**, *Vatke in Linnæa*, xxxvii. 319. A perennial herb, with the root-fibres thickened at the end into oblong tubers. Stems herbaceous, erect, pubescent, 2–3 ft. long, simple or slightly branched. Leaves sessile, oblong, membranous, crenate, slightly pubescent, 3–6 in. long. Whorls many-flowered, remote, forming a simple terminal racemose panicle 5–6 in. long; pedicels pubescent, longer than the calyx.

Calyx pubescent, $\frac{1}{8}$ – $\frac{1}{6}$ in. long; upper tooth ovate, as long as the tube; lower lanceolate-deltoid. Corolla above $\frac{1}{2}$ in. long; lower lip deeply concave, oblong-navicular, nearly as long as the tube.—N. E. Br. in Kew Bulletin, 1894, 11. *C. tuberosus*, A. Rich. Tent. Fl. Abyss. ii. 185; Engl. Hochgebirgsfl. Trop. Afr. 360, non Benth. *C. palustris* and *C. rivularis*, Vatke, l. c.

Nile Land. Abyssinia: Begemeder; near Gafat, 8200 ft., *Schimper*, 1172! 1212! in marshes at Jan Meda, 8400 ft., *Schimper*, 1186! Province of Shire, near Kouaieta, *Quartin-Dillon*; in the province of Godjam, *Quartin-Dillon*; and without precise locality, *Parkyns*!

4. **C. Kilimandschari**, *Gürke in Engl. Hochgebirgsfl. Trop. Afr.* 359. A perennial, with branchlets villous when young, pubescent when mature. Leaves sessile or shortly petioled, thick, fleshy, ovate-cuneate, deeply crenate, the lower 3–4 in. long, 2 in. broad, very hairy, canescent below. Panicles racemose, very long; whorls remote, subglobose, 6–10-flowered. Calyx densely clothed with white hairs; throat villous inside; upper tooth ovate; lower lanceolate-subulate.

Mozamb. Dist. German East Africa: Kilimanjaro, at Marangu, 4900 ft., *Volkens*, 427! *Meyer*, 377, and in forest at about 8000 ft., *Meyer*, 116.

5. **C. comosus**, *Hochst. ex A. Rich. Tent. Fl. Abyss. ii.* 183. An undershrub, with a woody main stem and short densely pubescent branches. Leaves sessile, obovate-cuneate, thick, fleshy, pubescent, crenate in the upper half; whorls aggregated into a short dense terminal spicate panicle; bracts small, orbicular, foliaceous; pedicels obsolete. Calyx hispid, $\frac{1}{6}$ in. long; tube campanulate; upper tooth small, ovate; lower lanceolate. Corolla nearly 1 in. long; tube very short; lower lip very large, deeply concave.—*Gürke in Engl. Jahrb.* xix. 212; *C. spicatus*, Benth. in DC. Prod. xii. 71, ex parte. *C. caninus*, Vatke in Linnæa, xxxvii. 318 (excl. syn. Roth); Engl. Hochgebirgsfl. Trop. Afr. 359.

Nile Land. Eritrea: Chagali, 3200 ft., *Schweinfurth & Riva*, 1071! near Acrur, 6000 ft., *Schweinfurth & Riva*, 1339! Near Aidereso, 4000 ft., *Schweinfurth & Riva*, 2202! Abyssinia: Tigre; Mount Semayata, 8000 ft., *Schimper*, 622. Mount Erareta, 11,300 ft., *Schimper*; Mount Aber, near Jenausa, *Schimper*, 1328, in the province of Shire, *Quartin-Dillon*; near Wadela Village in south-east Abyssinia, *Steudner*, 1422, and without precise locality, *Schimper*, 63!

6. **C. salagensis**, *Gürke in Engl. Jahrb.* xix. 220. Root tuberous. Stems branched, pubescent, 1–2 ft. long. Leaves long-petioled, membranous, ovate, 2–3 in. long, 1–1 $\frac{1}{2}$ in. broad, acute, narrowed to the base, nearly or quite glabrous on both sides, gland-dotted. Panicles racemose, lax, terminal; whorls 6–10-flowered; bracts ovate; pedicels $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Calyx pubescent, naked inside at the throat; upper tooth round-ovate, acute; edges not decurrent; lateral very short, round,

obtuse; lower acuminate, connate, shorter than the upper. Corolla blue, $\frac{1}{3}$ – $\frac{1}{2}$ in. long.

Upper Guinea. Togoland: near Bismarckburg, *Kling*, 199, *Büttner*, 94, 690.

This is known as the "Salaga Potato" by the colonists.

7. **C. elatus**, *Baker*. A herb 5–6 ft. high, with pubescent stems. Leaves shortly petioled, oblong, acute, crenate, membranous, nearly glabrous, 6 in. long, narrowed very gradually into a narrow wing to the petiole. Panicles racemose, very lax, simple, axillary and terminal, the end one reaching 8–9 in. long; whorls distant, many-flowered, pedicels short. Fruit-calyx $\frac{1}{3}$ in. long; upper tooth ovate; lateral small cusps, lower large cusps. Corolla red, $\frac{1}{2}$ in. long; lower lip deeply concave, as long as the tube.

Upper Guinea. Fernando Po, 2000 ft., *Mann*, 584!

Lower Guinea. Gaboon: Sierra del Crystal, *Mann*, 1661!

8. **C. ruwenzoriensis**, *Baker*. Stem slender, erect, pubescent. Leaves distinctly petioled, ovate, 2–3 in. long, acute, not cordate at the base, deeply crenate, membranous, thinly hairy on both surfaces. Panicles racemose, simple, very lax, axillary and terminal, the end one 6 in. long; lower whorls 6–8-flowered; pedicels pubescent, $\frac{1}{4}$ – $\frac{1}{3}$ in. long; bracts small, ovate. Fruit-calyx glabrescent, $\frac{1}{5}$ in. long; tube campanulate; upper tooth ovate-lanceolate, longer than the tube; 4 lower as long, lanceolate-cuspidate. Corolla lilac, $\frac{1}{3}$ in. long; lower lip as long as the tube.

Nile Land. British East Africa: Ruwenzori, in forest shade, 8000–10,000 ft., *Scott-Elliott*, 7556! 7798!

9. **C. decurrens**, *Gürke in Engl. Jahrb.* xix. 215. Stems pubescent, 3–4 ft. long. Leaves petioled, oblong, membranous, 4–5 in. long, 2–2 $\frac{1}{2}$ in. broad, acute or acuminate, decurrent at the base, serrate, glabrous. Panicles racemose, branched at the base; whorls distant, 6–8-flowered; cymes sessile; bracts lanceolate; pedicels short, clothed, like the axis and calyx, with dense pubescence. Flower-calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long, naked at the throat inside; upper tooth orbicular, obtuse; margins scarcely decurrent; lateral teeth deltoid, acuminate; lower pair lanceolate-subulate, longer than the upper. Corolla bright yellow.

Upper Guinea. Cameroons: by the side of a brook, near Buea, 3000 ft., *Preuss*, 948.

10. **C. leptophyllus**, *Baker*. Stems long, erect, slender, fragile, slightly pubescent. Leaves petioled, oblong, membranous, deeply crenate, nearly glabrous, cuneate at the base, 5–6 in. long, 2 $\frac{1}{2}$ –3 in. broad at the middle. Panicles racemose, lax, 6 in. long; flowers usually 2 in a whorl; pedicels erecto-patent, $\frac{1}{4}$ in. long. Flower-calyx $\frac{1}{6}$ in. long; fruit-calyx $\frac{1}{4}$ in.; upper tooth ovate, shorter than the oblong tube; 4 lower as long, lanceolate. Corolla $\frac{1}{2}$ in. long; lower lip as long as the tube.

Nile Land. British East Africa; collected in a journey from Ribi to the Galla Country, *Wakefield*!

11. **C. Dupuisii**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 70. A branched herb, with shortly pubescent quadrangular stems. Leaves shortly petioled, elliptic or suborbicular, $\frac{1}{2}$ –1 in. long, obtuse, crenate, dull green on both surfaces, with scattered crisped hairs above, glandular-pubescent beneath. Panicle racemose, 3–4 in. long, lax except at the apex; whorls many-flowered; pedicels $\frac{1}{10}$ in. long; bracts oblong. Fruit-calyx $\frac{1}{6}$ in. long, pubescent; teeth as long as the tube; upper ovate; lower acuminate. Corolla protruding $\frac{1}{8}$ – $\frac{1}{6}$ in. from the throat of the calyx; lower lip $\frac{1}{2}$ – $\frac{1}{8}$ in. long.—*De Wild. & Dur. Ill. Fl. Congo*, i. t. 26.

Lower Guinea. Lower Congo: forest of Mayombe, *Dupuis*.

12. **C. Dewèvrei**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 71. A tall herb, with pubescent branches. Leaves shortly petioled, elliptic or ovate-elliptic, 1–2½ in. long, obtuse, regularly and closely crenate, shortly pubescent above, slightly pubescent on the main ribs beneath. Panicle racemose, lax, 4–5 in. long; whorls many-flowered; bracts small, ovate, deciduous; pedicels $\frac{1}{2}$ – $\frac{1}{8}$ in. long. Calyx finally $\frac{1}{6}$ in. long; upper tooth ovate, as long as the tube; lower acuminate. Corolla blue, protruding $\frac{1}{3}$ from the throat of the calyx; lower lip $\frac{1}{5}$ in. long.

Lower Guinea. Congo, *Dewèvre*, 1092A.

13. **C. assurgens**, *Baker*. A perennial, with a decumbent base and long ascending simple or branched slightly pubescent fragile stems. Leaves petioled, broad ovate, crenate, membranous, obscurely pubescent, 1½–2 in. long. Panicles racemose, long, lax, axillary and terminal, the end one 4–6 in. long; lower whorls 12–15-flowered; pedicels reaching $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Fruit-calyx $\frac{1}{6}$ in. long; upper lip ovate, shorter than the tube; 4 lower lanceolate, as long as the upper. Corolla above $\frac{1}{2}$ in. long; lower lip as long as the tube.

Nile Land. Abyssinia: Begemeder, *Schimper*!

Habit of *C. latifolius*, *Hochst*.

14. **C. Penzigii**, *Dammann in Gartenfl.* 1892, 525. A perennial herb, with stoutish stems, clothed with fine spreading white hairs. Leaves ovate, crenate, membranous, finely hairy, especially below, narrowed suddenly to a petiole which is winged down to the base, the lower 3–4 in. long. Whorls simple, lax, 8-flowered, forming a lax long racemose panicle; bracts small, deciduous; pedicels unequal, hairy, the longest $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Calyx $\frac{1}{6}$ in. long; tube campanulate, very hairy; teeth deltoid, longer than the tube, the two lateral ones smaller than the others. Corolla-tube twice as long as the calyx; lower lip deeply cymbiform, bright lilac, $\frac{1}{4}$ in. long. Stamens included in the lower lip.—*Gard. Chron.* xiv. (1893) 616; *Notizb. König. bot. Gart. Berlin*, 1895, 7.

Nile Land. Eritrea: Chagali, 3200 ft., *Schweinfurth & Riva*, 1070! Acnur, 6000 ft., *Schweinfurth & Riva*, 1230! cultivated specimen, *Penzig*!

Described from a plant that flowered at Kew in November 1893.

15. **C. bullulatus**, Briquet in *Bull. Soc. Bot. Belg.* xxxvii. 69. Stem thinly clothed with short crisped pubescence. Leaves petioled, ovate, 1–2 in. long, acute, rounded at the base, crenate, pubescent on both surfaces, bullate. Cymes subsessile, forming a lax racemose panicle 5–6 in. long; pedicels finally $\frac{1}{3}$ – $\frac{1}{2}$ in. long; bracts deciduous. Flower-calyx $\frac{1}{8}$ in. long; upper tooth broadly ovate, with decurrent edges; lateral small, obtuse; lower lip broad, membranous, emarginate. Corolla protruded $\frac{1}{2}$ in. from the throat of the calyx; tube declinate; lower lip $\frac{1}{4}$ in. long. Stamens not exerted.—*Solenostemon bullatus*, Briquet in *Engl. Jahrb.* xix. 180.

South Central. Congo Free State: Lunda: Lulua River, *Pogge*, 356.

16. **C. lanuginosus**, Hochst.; *Benth. in DC. Prod.* xii. 79. Root bearing small tubers. Stem long, erect, branched, fragile, pubescent. Leaves petioled, ovate, membranous, crenate, densely pubescent, 2–3 in. long. Panicle racemose, long, lax, simple, axillary and terminal, the end one 6–8 in. long; whorls many-flowered; pedicels as long as the fruit-calyx. Fruit-calyx densely hairy, $\frac{1}{4}$ in. long; upper tooth large, ovate, 4 lower large, lanceolate. Corolla $\frac{1}{2}$ in. long; lower lip as long as the tube.—A. Rich. *Tent. Fl. Abyss.* ii. 184; Oliv. in *Trans. Linn. Soc.* xxix. 137; *Engl. Hochgebirgsfl. Trop. Afr.* 360; N. E. Br. in *Kew Bulletin*, 1894, 11. *C. albidus*, Vatke in *Linnæa*, xxxvii. 321; *Engl. l. c.* 361.

Nile Land. Eritrea: Saganeiti, on the north side towards Selet, 6500–7100 ft., *Schweinfurth & Riva*, 1184! Abyssinia: Tigre: near Adowa, *Schimper*, 1915! Amba Sea, 6500 ft., *Schimper*, 251; Begemeder; Mettaro, 800 ft., *Schimper*, 347! near Magdala, *Steudner*, 1391; Mount Erareta, 11,700 ft., *Schimper*; Aman Eski, *Schimper*, 342; Samen; Ghaba, *Steudner*, 1391; province of Shire, *Quartin-Dillon*; and without precise locality, *Quartin-Dillon & Petit*, 3! British East Africa: Unyoro, *Speke & Grant*, 588!

17. **C. trichophorus**, Briquet in *Bull. Herb. Boiss.* ii. 130. A dwarf little-branched herb. Stems very hairy, creeping at the base, then suddenly ascending. Leaves ovate, obtuse, 2–3 in. long, rounded at the base, membranous, crenate-dentate, with scattered short hairs on both sides. Panicle racemose, 5–6 in. long; whorls distant; pedicels $\frac{1}{4}$ – $\frac{1}{3}$ in. long, glandular-pubescent; bracts deciduous. Calyx campanulate, at first $\frac{1}{6}$ in., finally $\frac{1}{3}$ in. long; tube very villous; teeth subulate, as long as the tube. Corolla $\frac{1}{3}$ – $\frac{1}{2}$ in. longer than the calyx.

Nile Land. Abyssinia: Aman Eski Mountain, 6500 ft., *Schimper*, 342 of 1854 collection.

Near *C. lanuginosus*, Hochst.

18. **C. barbatus**, *Benth. in DC. Prod.* xii. 71. An erect perennial 2–4 ft. high, with woody main stems and pubescent branches. Leaves petioled, ovate or oblong, obtuse, crenate, cuneate at the base, 1–4 in. long, very pubescent on both sides. Panicle racemose, lax, simple, $\frac{1}{2}$ –1 ft. long; whorls many-flowered; pedicels hairy, pubescent, reaching $\frac{1}{4}$ in. long; bracts ovate-cuspidate, pubescent, deciduous. Fruit-calyx $\frac{1}{6}$ in.

long, pubescent, campanulate; upper tooth suborbicular, mucronate, as long as the tube; 4 lower small cusps. Corolla bright blue, $\frac{1}{2}$ in. long; lower lip as long as the tube.—A. Rich. Tent. Fl. Abyss. ii. 183; Wight, Ic. t. 1432; Oliv. in Trans. Linn. Soc. xxix. 137; Hook. f. Fl. Brit. Ind. iv. 625; Engl. Hochgebirgsfl. Trop. Afr. 359; N. E. Br. in Kew Bulletin, 1894, 10. *C. Forskohlii*, var. *adoensis*, Briquet in Ann. Jard. Genève. ii. (1898) 235. *Plectranthus barbatus*, Andr. Bot. Rep. t. 594. *Ocimum cinereum*, R. Br. in Salt, Abyss., App. 64.

Nile Land. Nubia: Erkowit Mountain, near Suakin, *Schweinfurth*, 229! Eritrea: Ginda, 3000 ft., *Schweinfurth*, 390! Bogos; Atirba, near Keren, *Steudner*, 1392! Lalasse Mountain, near Keren, *Steudner*, 1400. Abyssinia: Tigre; near Adowa, *Schimper*, 333! Mount Sholoda, 7000 ft., *Schimper*, 284; province of Wojerat, *Petit*! and without precise locality, *Schimper*, 502! *Plowden*! British East Africa: Uganda; in cultivated ground, *Wilson*, 124!

Mozamb. Dist. German East Africa: Unyamwezi; Mininga, *Speke & Grant*, 73!

Also in Tropical Asia.

Var. *Schimperi*, Baker. A low alpine form, with very woody main stems and shortly densely pubescent branches, leaves, and flowers.—*C. Schimperi*, Vatke in Linnaea, xxxvii. 320; Engl. l. c. 360. *C. rupestris*, Hochst. in Schimp. Pl. Abyss. No. 2172.

Nile Land. Abyssinia: Tigre; summit of Mount Semayata, 9800 ft., *Schimper*, 618! and without precise locality, *Schimper*, 41!

19. **C. gomphophyllus**, *Baker in Kew Bulletin*, 1895, 225. A perennial herb, with densely pubescent branchlets. Leaves petioled, obovate-cuneate, the lower $1\frac{1}{2}$ –2 in. long, shallowly crenate, membranous, densely pubescent on both surfaces. Panicles racemose, long, lax; whorls ebracteate, 10–12-flowered; pedicels longer than the calyx. Calyx pubescent, finally $\frac{1}{4}$ in. long; tube campanulate; upper lip ovate, the others lanceolate-deltoid. Corolla-tube as long as the calyx; upper lip small; lower oblong, 4–5 lin. long. Stamens not exerted beyond the lower lip.

Nile Land. British Somaliland: Golis range, *Mrs. E. Lort-Phillips*!

20. **C. flavovirens**, *Gürke in Engl. Pfl. Ost-Afr. C.* 347. Stem villous, with jointed hairs. Leaves petioled, lanceolate or oblong, narrowed to the base, acute, crenate, moderately thick, yellowish-green, pubescent and furnished with yellow glands on both surfaces. Panicles racemose, dense, terminal; bracts ovate, acuminate, villous; pedicels shorter than the calyx. Calyx accrescent, villous outside and at the throat inside; upper tooth suborbicular, the others subulate, subequal. Corolla violet.

Mozamb. Dist. Kilimanjaro: near Lake Chala, 3000 ft., *Volkens*, 1771.

21. **C. Schinzii**, *Gürke in Bull. Herb. Boiss.* vi. 555. A tall herb, with a simple or slightly branched rather thick stem, clothed with long spreading hairs. Leaves shortly petioled, oblong or obovate, the lower

above 2 in. long, narrowed to the base, entire or obscurely toothed, fleshy, glabrescent or pubescent on both surfaces. Panicles racemose, long, simple; whorls 6-10-flowered; bracts broad, acute, ciliate, projecting beyond the buds; pedicels $\frac{1}{2}$ lin. long. Fruit-calyx hispid, $\frac{1}{6}$ - $\frac{1}{5}$ in. long; throat villous inside; upper tooth broadly ovate; lower lanceolate-subulate.

Lower Guinea. German South-west Africa: Ambo-land, *Schinz*, 56.

22. **C. decumbens**, *Gürke in Engl. Jahrb.* xix. 211. Perennial. Stems stoloniferous, decumbent at the base, pubescent. Leaves small, thick, fleshy, petioled, the lower rhomboid-ovate, the upper ovate-lanceolate, $\frac{1}{2}$ -1 in. long, obtuse, narrowed to the base, deeply crenate-dentate, pubescent on both sides. Panicles racemose, dense, terminal and in the axils of the upper leaves; flowers few in a whorl; bracts broadly ovate, obtuse, fleshy, deciduous; pedicels pubescent, $\frac{1}{6}$ in. long. Calyx sub-hispid; throat hairy inside; upper tooth round, apiculate, $\frac{1}{6}$ in. long, the edges scarcely decurrent; the others subequal, lanceolate-deltoid, ciliate. Corolla-tube bent down; lower lip violet, much narrowed to the base; upper blue outside, white and spotted inside.

Nile Land. British East Africa: Duruma district, near Txamtei, *Hildebrandt*, 2320.

Mozamb. Dist. German East Africa: Kilimanjaro; on the stony ridge of the crater at Lake Chala, 3000 ft., *Volkens*, 327!

23. **C. tetensis**, *Baker*. A perennial herb, with short slender ascending, slightly pubescent stems. Leaves small, fleshy, aromatic, ovate-cuneate, crenate, slightly pubescent. Panicles spicate, simple, 1-3 in. long, moderately dense; pedicels obsolete. Fruit-calyx $\frac{1}{6}$ in. long, slightly pubescent; tube campanulate; upper tooth orbicular, mucronate, longer than the tube; 4 lower as long, lanceolate. Corolla $\frac{1}{2}$ in. long.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; near Tete, *Kirk*!

24. **C. vestitus**, *Baker in Kew Bulletin*, 1895, 224. A perennial herb, with branchlets densely clothed with white spreading hairs. Leaves petioled, ovate, 1-1 $\frac{1}{2}$ in. long, crenate, moderately thick, densely pubescent on both surfaces. Panicles racemose, long, lax; whorls 5-6-flowered; pedicels as long as the calyx; bracts small, ovate, foliaceous. Calyx pubescent, finally $\frac{1}{5}$ - $\frac{1}{4}$ in. long; tube campanulate; teeth as long as the tube; upper ovate, the others lanceolate. Corolla-tube as long as the calyx; upper lip small, orbicular; lower oblong-unguiculate, $\frac{1}{3}$ - $\frac{1}{2}$ in. long. Stamens as long as the lower lip.

Nile Land. British Somaliland; Golis range, 3000 ft., *Miss Edith Cole!*
Mrs. Lort-Phillips!

25. **C. speciosus**, *Baker f. in Journ. Bot.* 1899, 64. A perennial herb. Stem covered with white hairs. Leaves distinctly petioled, thick, fleshy, oblong or ovate-oblong, 2-3 in. long including the petiole,

serrate or crenate, narrowed to the base, hairy on both surfaces. Panicles racemose, long; whorls 5-6-flowered, the lower nearly 1 in. apart; pedicels glandular-hairy, $\frac{1}{4}$ - $\frac{1}{3}$ in. long; bracts ovate. Calyx in fruit $\frac{1}{3}$ in. long; upper tooth ovate, acuminate; lower lanceolate, acuminate. Corolla purple, nearly 1 in. long; tube longer than the calyx; upper lip small, reflexed; lower much larger. Stamens included in the lower lip of the corolla.

Nile Land. British Somaliland: Waggar Mountains, *Mrs. E. Lort-Phillips*.

26. **C. Schweinfurthii**, *Baker*. An erect perennial herb, with densely pilose stem. Leaves distinctly petioled, ovate, 1-1 $\frac{1}{2}$ in. long, thick but not fleshy, obscurely crenate, not cordate at the base, densely pilose on both surfaces. Panicles racemose, simple, very lax, sometimes 1 ft. long; pedicels pubescent, $\frac{1}{8}$ - $\frac{1}{6}$ in. long. Fruit-calyx pubescent, $\frac{1}{4}$ in. long; tube campanulate; upper tooth ovate, as long as the tube; lower lanceolate, not longer. Corolla $\frac{1}{2}$ in. long; lower lip longer than the tube. Stamens not exerted.

Nile Land. Eritrea: Magod Valley, 4500 ft., *Schweinfurth & Riva*, 1810!

27. **C. petersianus**, *Vatke in Linnæa*, xl. 180. An erect perennial herb 2 ft. high, with stems glandular-villous upwards. Leaves shortly petioled, ovate, shortly acuminate, subacute, crenate, reticulato-rugose, 2 in. long, above 1 in. broad, broadly rounded at the base, subglabrous above, hairy on the veins beneath. Panicles racemose, long, simple; whorls lax, 12-flowered; pedicels long, spreading; bracts deciduous. Calyx declinate, pubescent; upper tooth ovate, subacute; lateral minute, truncate; lower short, acute, nearly cuneate to the tip. Corolla scarcely inflated at the throat.

Mozamb. Dist. Portuguese East Africa: Rio de Sena, in damp soil, *Peters*.
Near *C. scutellarioides*, Benth. (*Bot. Mag.* t. 1446.)

28. **C. tricholobus**, *Gürke in Engl. Jahrb.* xix. 220. Stems pubescent. Leaves broadly ovate, shortly petioled, fleshy, 1-1 $\frac{1}{2}$ in. long and nearly as broad, obtuse, narrowed to the petiole, deeply serrate, densely tomentose on both sides. Panicles racemose, long; whorls 6-10-flowered; pedicels short, pubescent. Calyx densely hairy and glandular-pubescent; upper tooth lanceolate, acute; edges not decurrent; lateral nearly twice as long ($\frac{1}{5}$ in.), subulate; lower shorter than the lateral, subulate. Corolla-tube deflexed.

Mozamb. Dist. German East Africa: Usambara; on hills near Mlalo, *Holst*, 455.

29. **C. cœruleus**, *Gürke in Engl. Jahrb.* xix. 217. Stem rooting at the base, glabrescent below, pubescent above. Leaves shortly petioled, broad, ovate, fleshy, 2-3 in. long, obtuse or subacute, narrowed to the base, deeply serrate, glabrous or pubescent on both sides. Panicles racemose, lax, terminal; whorls 6-10-flowered, sessile, simple; bracts oblong-lanceolate; pedicels as long as the calyx. Calyx pubescent,

$\frac{1}{5}$ in. long; upper tooth round-ovate, apiculate; edges not decurrent; lateral teeth lanceolate, as long as the upper; lower longer, lanceolate, very acuminate. Corolla blue, more than twice the length of the calyx.

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, 2000 ft., *Holst*, 8895!

30. **C. Camporum**, *Gürke in Engl. Jahrb.* xix. 214. Stems 3–4 ft. long, glabrescent below, pubescent upwards. Leaves shortly petioled, fleshy, broadly ovate, 3–4 in. long, $1\frac{1}{2}$ – $2\frac{1}{2}$ in. broad, obtuse or subacute, narrowed to the base, irregularly and deeply crenate, pubescent above, tomentose below. Inflorescence racemose, simple, terminal; whorls remote, 6–10-flowered; bracts broadly ovate or orbicular, acuminate; pedicels $\frac{1}{3}$ – $\frac{1}{2}$ in. long, clothed, like the calyx and axis, with long spreading hairs. Fruit-calyx $\frac{1}{6}$ in. long; upper tooth round, obtuse; edges slightly decurrent; the other teeth subequal, rather shorter than the upper, lanceolate-deltoid, acute, the lateral pair rather broader than the lower pair, which are not connate.

Mozamb. Dist. German East Africa: at the foot of Rhinoceros Hill, near the ford of the Pangani, 2500 ft., *Volkens*.

31. **C. gymnostomus**, *Gürke in Engl. Jahrb.* xix. 212. Perennial. Branches tomentose. Leaves distinctly petioled, thick, ovate, narrowed to the base, 2– $2\frac{1}{2}$ in. long, $1\frac{1}{2}$ –2 in. broad, obtuse or acuminate, crenate, subtomentose on both sides. Inflorescence racemose, terminal only; whorls 6–10-flowered; pedicels $\frac{1}{3}$ in. long, clothed like the axis with spreading whitish hairs. Calyx $\frac{1}{4}$ in. long; tube broad, short, tomentose outside, naked within; upper tooth orbicular-cuspidate, with shortly decurrent edges; the others lanceolate, acuminate.

Mozamb. Dist. German East Africa: without precise locality, *Fischer*, 333.

32. **C. Welwitschii**, *Briquet in Engl. Jahrb.* xix. 185. A shrub, with trailing woody main stems and pubescent ascending branches. Leaves shortly petioled, ovate, with a cuneate base, obtuse, crenate, densely pubescent, 1– $1\frac{1}{2}$ in. long. Inflorescence racemose, long, lax, simple; whorls globose, many-flowered; pedicels short; bracts ovate, acuminate, protruding beyond the young flowers. Flower-calyx $\frac{1}{8}$ in. long; tube campanulate; upper tooth ovate, as long as the tube; lower tooth ovate, much shorter. Corolla $\frac{1}{4}$ – $\frac{1}{3}$ in. long; lower lip as long as the tube.

Lower Guinea. Angola: province of Pungo Andongo, *Welwitsch*, 5585! 5589!

33. **C. cuneatus**, *Baker f. in Journ. Bot.* 1899, 64. Stems erect, woody, clothed with red or fulvous pubescence. Leaves shortly petioled, cuneate or cuneate-ovate, $\frac{1}{2}$ – $1\frac{1}{2}$ in. long, coriaceous, serrate or crenate upwards, entire near the base, minutely bullate beneath. Whorls simple; lower nearly 1 in. apart; pedicels pubescent, longer than the flower-calyx. Calyx hairy; upper tooth ovate, acute; lower triangular,

acuminate. Corolla hairy; tube longer than the flower-calyx; upper lip recurved; lower navicular, $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Stamens as long as or longer than the lower lip of the corolla.

Nile Land. British Somaliland: Waggar Mountains, *Mrs. Lort-Phillips*.

34. **C. amboinicus**, *Lour.*, var. **violaceus**, *Gürke in Engl. Jahrb.* xix. 210. Stems shrubby at the base; branches thick, fleshy, pubescent. Leaves shortly petioled, ovate, acute, 1–2 in. long, rounded at the base, crenate, pubescent on both sides. Inflorescence racemose, long, lax, simple; whorls many-flowered; pedicels short; bracts ovate, acuminate. Calyx small, pubescent, campanulate, scarcely accrescent; upper tooth ovate-oblong, the others setaceous. Corolla violet or blue-violet, $\frac{1}{3}$ in. long.—*C. aromaticus*, Benth. in DC. Prod. xii. 72; Lindl. in Bot. Reg. t. 1520; Hook. f. Fl. Brit. Ind. iv. 625; Hiern in Cat. Afr. Pl. Welw. i. 865.

Lower Guinea. Angola: Loanda, *Welwitsch*, 5556!

Mozamb. Dist. German East Africa: Kilimanjaro; on the ridge of the crater at Lake Chala, 3000 ft., *Volkens*, 321! Usambara; at the foot of Rhinoceros Hill, by the ford of the Pangani, 2600 ft., *Volkens*, 487.

Also Tropical Asia.

35. **C. umbrosus**, *Vatke in Linnæa*, xliii. 91. A shrub, with woody stems and pubescent branchlets. Leaves petioled, ovate, acute, crenate, membranous, nearly glabrous, 2–3 in. long. Panicle racemose, moderately dense, the end branch 5–6 in. long; whorls few-flowered; pedicels very short. Fruit-calyx $\frac{1}{3}$ in. long; tube curved, campanulate, very gibbous on the lower side, pubescent, strongly ribbed; upper tooth ovate-lanceolate, shorter than the tube; 4 lower teeth large linear-subulate cusps. Corolla nearly 1 in. long; lower lip deeply concave, as long as the tube.—Dewèvre in Comptes rendus Soc. Bot. Belg. xxxiii. 105.

Nile Land. British East Africa: Taita; Ndara, *Hildebrandt*, 2424, and at Mwatate, 2000 ft., *Johnston*! Ukamba; Kitui, *Hildebrandt*, 2743!

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, *Holst*, 9159! Kilimanjaro; at Kwa Ngowe, *Volkens*, 357! British Central Africa: Nyasaland; Blantyre, *Descamps*.

36. **C. Mahonii**, *Baker*. A shrub with finely pubescent slender branchlets. Leaves distinctly petioled, ovate, 2–3 in. long, acute, cuneate at the base, distinctly crenate, membranous, green and nearly glabrous above, paler and finely pubescent beneath. Inflorescence racemose, simple, lax; whorls 3–4-flowered; pedicels $\frac{1}{8}$ – $\frac{1}{6}$ in. long; bracts foliaceous, as long as the pedicels. Calyx $\frac{1}{8}$ in. long, nearly glabrous; tube campanulate; teeth lanceolate, unequal, as long as the tube. Corolla lilac, $\frac{1}{3}$ in. long; tube cylindrical; lips much shorter than the tube. Stamens shortly exerted.

Mozamb. Dist. British Central Africa: Nyasaland, *Mahon*!

Described from a living plant raised from seeds sent by Mr. J. Mahon, which flowered at Kew in December, 1899.

37. **C. maranguensis**, *Gürke in Engl. Jahrb.* xix. 216. A shrub, with hairy branchlets. Leaves long-petioled, membranous, suborbicular

or broadly ovate, 1–2 in. long, subobtuse, narrowed to the base, serrate, clothed with adpressed hairs on both sides. Inflorescence racemose, long, terminal; whorls remote, lax, few-flowered; pedicels $\frac{1}{4}$ – $\frac{1}{3}$ in. long, clothed, like the axis and calyx, with very long fine glandular hairs; bracts ovate. Calyx $\frac{1}{4}$ in. long; throat naked inside; upper tooth ovate, acute; edges shortly decurrent; other teeth lanceolate, acute. Corolla-tube deflexed; lower lip long, boat-shaped.

Mozamb. Dist. German East Africa: Kilimanjaro; near Marangu, 5000 ft., *Volkens*, 630.

38. **C. igniarius**, *Schweinf. Beitr. Fl. Aethiop.* 121. Shrubby, with thick terete woody branches, without leaves at the time of flowering. Leaves petioled, broadly ovate, subacute, deeply crenate, 2 in. long, subglabrous above, pubescent beneath. Whorls 3–5, approximate; lowest 10–15-flowered; pedicels pubescent, finally 1 in. long. Calyx $\frac{1}{12}$ in. long; tube campanulate; upper tooth ovate; lower teeth shorter, deltoid-cuspidate. Corolla above $\frac{1}{2}$ in. long. Stamens longer than the lower lip, recurved.

Nile Land. Eritrea: Arrot Valley, 4300 ft., *Schweinfurth & Riva*, 1122! 1398! Abyssinia: on mountains near Dehli-Dikeno, 4000 ft., *Schimper*.

Introduced into cultivation by Dr. Schweinfurth in 1894.

39. **C. ghindanus**, *Schweinf. Pl. Abyss. Sept. Exsicc. No.* 2149. An undershrub, with pubescent woody branchlets. Leaves produced after the flowers, distinctly petioled, ovate, 2 in. long, irregularly crenate, not cordate at the base, rather fleshy, green and thinly pubescent on both surfaces. Inflorescence racemose, lax, moderately long (the end branch 5–6 in. long); whorls umbellate, many-flowered; pedicels slender, rigid, erecto-patent, pubescent, finally $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Fruit-calyx pubescent, $\frac{1}{8}$ in. long; tube campanulate; upper tooth ovate; lower rather longer, lanceolate-cuspidate. Corolla $\frac{1}{2}$ in. long; lower lip as long as the tube. Stamens as long as the lower lip.

Nile Land. Eritrea: in the great valley of Ginda, 3000–4200 ft., *Schweinfurth*, 2149!

40. **C. Malinvaldi**, *Briquet in Ann. Jard. Genève.* ii. (1898) 240. A shrub, destitute of leaves at the flowering time, with divaricate branches and brown bark. Leaves distinctly petioled, broadly ovate, subobtuse, 1–2 in. long, fleshy, obscurely toothed, green and pubescent on both sides. Whorls 6–10-flowered, 2–6 in a racemose panicle; pedicels long, finely pubescent; bracts minute, deciduous. Calyx campanulate, $\frac{1}{8}$ in. long in flower; upper lip ovate, obscurely cuspidate, not decurrent; lower teeth deltoid-cuspidate. Corolla $\frac{1}{2}$ in. longer than the calyx; lower lip $\frac{1}{3}$ in. long.—*Plectranthus Malinvaldi*, *Briquet in Bull. Herb. Boiss.* ii. 125.

Nile Land. Abyssinia: at Dehli-Dikeno, 3500–4500 ft., *Schimper*, 529 of 1854 collection.

41. **C. maculatus**, *Gürke in Engl. Jahrb.* xix. 210. A shrub with hairy branches. Leaves distinctly petioled, broadly ovate or sub-rhomboid, 3–4 in. long, 2–3 in. broad, narrowed to a short petiole, obtuse, irregularly and deeply crenate, subtomentose on both sides. Inflorescence racemose, terminal, very long; whorls remote, 6–10-flowered; bracts ovate, subobtuse; pedicels $\frac{1}{4}$ in. long, like the axis and calyx clothed with long spreading hairs. Fruit-calyx $\frac{1}{5}$ in. long; tube short; throat densely hairy inside; upper tooth ovate, acute, with flat shortly decurrent edges; the others lanceolate. Corolla blue; tube bent down; lower lip long.

Mozamb. Dist. German East Africa: Kilimanjaro; near Marangu, 5000 ft., *Volkens*, 429.

42. **C. aulihanensis**, *Schweinf. & Volk. Liste Pl. Somalis*, 12. A shrub 7–8 ft. high, with fleshy rather thick branches, without leaves at the time of flowering. Inflorescence racemose, terminal, subsessile, glanduloso-villous; whorls 4–5, approximate, 8-flowered; flowers strongly scented; pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Calyx finally $\frac{1}{3}$ in. long; upper tooth broadly ovate; lower subulate. Corolla above 1 in. long; lower lip large, acute, villous. Stamens as long as the lower lip.

Nile Land. Somaliland: in the country of the Aulihan tribe, *Ghika*.

Near *C. igniarius*, Schweinf.

43. **C. lasianthus**, *Gürke in Engl. Jahrb.* xix. 212. Perennial. Stems villous. Leaves unknown. Inflorescence racemose, terminal, dense; bracts ovate or ovate-lanceolate, sessile, obtuse, villous, thick, nearly $\frac{1}{2}$ in. long; pedicels adpressed to the axis, villous, shorter than the calyx. Calyx $\frac{1}{4}$ in. long, villous outside and at the throat inside; tube broad, short; upper tooth round-apiculate, the edges scarcely decurrent; the rest subequal, deltoid, acute. Corolla-tube curved; lower lip much narrowed to the base.

Mozamb. Dist. German East Africa: Irangi district, *Fischer*, 507.

Allied to *C. comosus* and *C. decumbens*.

44. **C. longipetiolatus**, *Gürke in Engl. Jahrb.* xix. 214. An undershrub, with pubescent branchlets. Leaves long-petioled, ovate-elliptic, 4–5 in. long, 2–3 in. broad, acute, narrowed to the base, deeply serrate, ciliate, glabrous except on the principal ribs. Inflorescence racemose, lax, terminal and in the axils of the upper leaves; whorls few-flowered; bracts small, linear; pedicels $\frac{1}{3}$ – $\frac{1}{2}$ in. long, clothed like the axis with brown pubescence. Fruit-calyx $\frac{1}{4}$ in. long; tube short, broad; upper tooth deltoid-ovate, acuminate; edges scarcely decurrent; lateral teeth lanceolate-deltoid, acuminate; lowest lanceolate, acuminate, connate downwards. Corolla-tube bent down; lower lip long, cymbiform.

Mozamb. Dist. German East Africa: Usambara; at Kwa Mshuza, 5000 ft., *Holst*, 9076!

Near *C. garckeianus*, Vatke.

45. **C. orbicularis**, *Baker*. A shrub 4 ft. high. Stems stout, woody, densely pubescent. Leaves petioled, orbicular, fleshy, crenate, slightly pubescent, 3–4 in. long and broad. Panicle racemose; branches few, dense, the end one 5–6 in. long; rhachis densely villous; cymes many-flowered, slightly compound; pedicels reaching $\frac{1}{4}$ in. long. Fruit-calyx $\frac{1}{6}$ in. long, densely pubescent; teeth small; upper ovate; lower lanceolate. Corolla hairy, $\frac{1}{2}$ in. long.

Lower Guinea. Angola: province of Benguela, *Welwitsch*, 5619!

46. **C. latifolius**, *Hochst.*; *Benth. in DC. Prod.* xii. 74. Root tuberous. Stems erect, simple, fragile, pubescent, 1 ft. long. Leaves petioled, ovate, acute, crenate, membranous, pubescent, 1–3 in. long, cuneate at the base. Inflorescence racemose, lax, simple, 4–6 in. long; cymes sessile, many-flowered, dense, slightly compound; pedicels as long as the calyx. Fruit-calyx $\frac{1}{6}$ in. long; tube campanulate; upper tooth large, ovate; lateral shorter, orbicular; 2 lower acute, connate high up. Corolla $\frac{1}{3}$ in. long; lower lip longer than the tube.—*A. Rich. Tent. Fl. Abyss.* ii. 184; *Engl. Hochgebirgsfl. Trop. Afr.* 361.

Nile Land. Abyssinia: Samen; in fissures of rocks near Gapdia, 4000–7000 ft., *Schimper*, 825! Gafta, *Schimper*, 1228! Begemeder; near Sanka Berr, 7500 ft., *Schimper*, 1225! In the province of Shire, *Quartin-Dillon*, and without precise locality, *Schimper*, 645!

Var. *madiensis*, *Baker*. Stems branched. Leaves smaller, truncate at the base. Cymes laxer. Calyx smaller.—*C. latifolius*, *Oliv. in Trans. Linn. Soc.* xxix. 137.

Nile Land. British East Africa: Madi, common, *Speke & Grant*!

Perhaps a species distinct from the Abyssinian plant.

47. **C. dysentericus**, *Baker in Kew Bulletin*, 1894, 10. Root globose, tuberous. Stem short, stout, erect, glabrous. Leaves petioled, fleshy, oblong, obtuse, shallowly crenate, glabrous, 1–2 in. long, narrowed very gradually to the petiole. Inflorescence racemose, very lax, 3–5 in. long; whorls distant, globose, sessile, slightly compressed; pedicels short, pubescent. Flower-calyx $\frac{1}{12}$ in. long, pubescent; tube campanulate; upper tooth large, ovate; lower teeth small, deltoid. Corolla $\frac{1}{4}$ in. long, hairy outside.

Upper Guinea. Lagos: Yoruba, *Barter*, 846!

Cultivated and used in cases of dysentery under the name of "Krodyn."

48. **C. nervosus**, *Briquet in Engl. Jahrb.* xix. 185. A tall herb, with ascending pilose branches. Leaves petioled, oblong, $1\frac{1}{2}$ –2 in. long, subobtuse, narrowed to the base, regularly crenate, green on both surfaces, pubescent especially beneath. Inflorescence racemose, 2–4 in. long; cymes nearly sessile; pedicels very short; bracts deciduous. Calyx in flower $\frac{1}{2}$ lin., in fruit $\frac{1}{8}$ – $\frac{1}{6}$ in. long; upper tooth ovate; lateral teeth small; lower lanceolate, connate downwards. Corolla protruding $\frac{1}{4}$ in. from the throat of the calyx; upper lip small, minutely 3-lobed; lower $\frac{1}{8}$ in. long. Stamens included.

South Central. Congo Free State: Kasongo; near the Lomami River, *Pogge*, 1034.

49. **C. poggeanus**, *Briquet in Engl. Jahrb.* xix. 182. A tall herb, with slightly pilose branches. Leaves distinctly petioled, broadly ovate, above 1 in. long, acute, rounded at the base, regularly crenate, green and subglabrous on both surfaces. Inflorescence racemose, 6 in. long, lax downwards; lower cymes very shortly peduncled; pedicels $\frac{1}{12}$ – $\frac{1}{8}$ in. long; bracts lanceolate, more or less persistent. Fruit-calyx $\frac{1}{8}$ in. long; upper tooth ovate, shortly decurrent; lateral teeth truncate; lower acuminate. Corolla protruding $\frac{1}{6}$ in. from the throat of the calyx; upper lip very small; lower $\frac{1}{8}$ in. long. Stamens not exerted.

South Central. Congo Free State: Lunda; Mussumba, *Pogge*, 364.

50. **C. silvaticus**, *Gürke in Engl. Jahrb.* xix. 213. Stems erect, branched, glabrous. Leaves shortly petioled, membranous, ovate, 1–1 $\frac{1}{2}$ in. long, rounded or narrowed at the base, acuminate, deeply serrate, glabrous above, pubescent when young beneath. Inflorescence racemose, branched; whorls remote, 8–14-flowered; cymes sessile or shortly peduncled; pedicels $\frac{1}{6}$ – $\frac{1}{4}$ in. long, pubescent like the axis. Upper tooth of the calyx round-ovate, obtuse; edges slightly decurrent; lateral teeth shorter, oblong, obtuse or cuspidate; lower very long ($\frac{1}{3}$ in.) subulate, connate downwards.

Mozamb. Dist. German East Africa: Usambara; on the border of the forest of tall trees, *Holst*, 3704, 3708.

51. **C. floribundus**, *Baker*. An erect perennial herb, with shortly pubescent stems. Leaves sessile, ovate, acuminate, deeply crenate, membranous, pubescent, those at the base of the panicle 2 in. long. Inflorescence a lax ample panicle, above 1 ft. long, with ascending branches, slightly compound downwards; pedicels $\frac{1}{12}$ – $\frac{1}{4}$ in. long, densely pubescent. Flower-calyx densely pubescent, $\frac{1}{8}$ in. long; teeth subequal, as long as the campanulate tube. Corolla $\frac{5}{8}$ in. long; lower lip as long as the tube.

Nile Land. Abyssinia: without precise locality, *Schimper*, 21 of 1853 collection!

52. **C. garckeanus**, *Vatke in Linnæa*, xxxvii. 323. A tall herb, with erect fragile pubescent stems. Leaves long-petioled, ovate, acute, deeply crenate, membranous, 4–5 in. long, slightly hairy on both sides. Inflorescence racemose, lax, cylindrical, 1 ft. long; cymes many-flowered, distant, sessile, slightly compound; pedicels pubescent, sometimes $\frac{1}{2}$ – $\frac{3}{4}$ in. long. Flower-calyx $\frac{1}{4}$ – $\frac{1}{3}$ in. long; upper tooth ovate, as long as the tube; 4 lower teeth as long, lanceolate. Corolla nearly 1 in. long; lower lip longer than the tube.—*Engl. Hochgebirgsfl. Trop. Afr.* 361.

Nile Land. Abyssinia: Begemeder; in the valley of the River Reb and on the surrounding mountains, 7000–8000 ft., *Schimper*, 1193!

53. **C. betonicoides**, *Baker*. Stem erect, branched, shortly pubescent. Leaves long-petioled, ovate, crenate, cuneate at the base, not very thin, 1–2 in. long, pubescent on both sides. Inflorescence racemose, 8–9 in. long; whorls distant, dense, globose, sessile, slightly

compound; pedicels reaching $\frac{1}{4}$ in. long. Flower-calyx pubescent, $\frac{1}{6}$ in. long; upper tooth ovate, as long as the tube; lateral teeth oblong, as long as the upper; lower short, linear. Corolla $\frac{1}{2}$ in. long; lower lip as long as the tube.—Hiern in Cat. Afr. Pl. Welw. i. 866.

Lower Guinea. Angola: province of Huilla, *Welwitsch*, 5612!

54. **C. alpinus**, *Vatke in Linnæa*, xxxvii. 322. Stem 3 ft. long, herbaceous, erect, shortly pubescent. Leaves petioled, ovate, acuminate, crenate, 3–4 in. long, truncate at the base. Inflorescence racemose, dense upwards; cymes shortly peduncled; pedicels as long as the fruit-calyx. Calyx with an ovate upper tooth; lower teeth short, lanceolate. Corolla 5 times the length of the calyx.—Engl. Hochgebirgsfl. Trop. Afr. 361.

Nile Land. Abyssinia: Begemeder; on mountains at Edda Jesus, near Debra Tabor, 9000 ft., *Schimper*.

55. **C. Autrani**, *Briquet in Bull. Herb. Boiss.* ii. 129. An erect herb, with long simple stems, obscurely pubescent upwards. Leaves petioled, ovate, acute, crenate, membranous, 3–4 in. long, slightly hairy. Inflorescence racemose, long, dense upwards, lax in the lower half; whorls many-flowered, dense, sessile, slightly compound; pedicels $\frac{1}{4}$ in. long. Flower-calyx pubescent, $\frac{1}{8}$ in. long; upper tooth ovate; lower teeth short, broad. Corolla $\frac{3}{4}$ in. long; lower lip as long as the tube.

Nile Land. Abyssinia: without precise locality, *Schimper*, 693 of 1853 collection!

56. **C. Schweinfurthii**, *Vatke in Linnæa*, xxxvii. 323 *in obs.* Nearly allied to *C. latifolius*, from which it differs by its creeping root-stock, in its leaves round-ovate, deeply crenate, truncate at the base, and in its densely softly villosolannate and longer pedicels.—Engl. Hochgebirgsfl. Trop. Afr. 361.

Nile Land. Eritrea: Habab; on basaltic hills, 4500–7000 ft., *Hildebrandt*, 438. Abyssinia: Bellaka, 6000–7000 ft., *Schimper*.

57. **C. repens**, *Gürke in Engl. Jahrb.* xix. 213. Stems creeping at the base, rooting at the nodes, pubescent. Leaves long-petioled, membranous, suborbicular, $\frac{1}{2}$ –1 in. long and broad, rounded or narrowed to the base, obtuse, deeply crenate, subglabrous or with a few adpressed hairs on both sides. Inflorescence racemose, very short; whorls remote, 4–6-flowered; cymes shortly stalked; bracts ovate, subacute; pedicels $\frac{1}{8}$ – $\frac{1}{5}$ in. long, pubescent like the calyx. Calyx naked inside at the throat, above $\frac{1}{4}$ in. long in fruit; upper tooth broadly ovate, obtuse, its edges not decurrent; lateral teeth shorter, oblong, subacute; lower very long, subulate; connate downwards. Corolla whitish, with a purple lower lip.

Upper Guinea. Cameroons: in forest near Buea, 4000 ft., *Preuss*, 949.

58. **C. nyikensis**, *Baker*. A much-branched erect low under-shrub, with pubescent woody branches. Leaves contemporary with the flowers, shortly petioled, very small, ovate, obtuse, entire, not cordate

at the base, thick and rather fleshy, 5-nerved from the base, pilose principally on the ribs beneath. Inflorescence racemose, dense, oblong, 1-1½ in. long; whorls many-flowered; cymes distinctly peduncled; pedicels short, pubescent. Fruit-calyx pubescent, ⅓ in. long; tube campanulate; teeth small; upper tooth ovate; lower teeth not larger, lanceolate. Corolla pubescent, ⅓ in. long; lower lip as long as the tube. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000-7000 ft., *Whyte!*

59. **C. mirabilis**, *Briquet in Engl. Jahrb.* xix. 183. A tall shrub, with robust branches clothed with grey down. Leaves petioled, lanceolate, 2-3 in. long, acute, narrowed to the base, regularly crenate, green and pubescent above, clothed with white tomentum beneath. Inflorescence racemose, long; whorls close, peduncled; bracts chartaceous, ovate, acuminate, imbricate in bud. Calyx violet, ¼ in. long in the flowering stage; tube campanulate; upper tooth lanceolate, the others short, ovate-lanceolate. Corolla dark blue, protruding above ½ in. from the throat of the calyx; lower lip ⅓ in. long. Stamens included or shortly exerted.

Lower Guinea. Angola: at Lumsuneya Brook, between Malange and the River Kuango, *Mechow*; in a swamp at Malange, *Mechow*, 489; in a moorland waste below Moma, near Malange, *Buchner*, 81, 82, 83, 84, 85.

South Central. Congo Free State; Lunda; by the Lulua River, *Pogge*, 350.

Briquet, l. c. 184, describes 4 varieties—viz., *mechowianus* (*Mechow*, no number); *poggeanus* (*Pogge*, 350); *hypisodontus* (*Mechow*, 489); and *buchnerianus* (*Buchner*, 81 to 85).

60. **C. thyrsoides**, *Baker ex Hook. f. in Bot. Mag. t.* 7672. A leafy much-branched perennial undershrub, 2-3 ft. high. Stem, petioles and inflorescence sparsely pubescent with spreading hairs. Lower leaves up to 7 by 4 in., ovate-cordate, acuminate, bright green above, paler beneath with prominent pubescent nerves, decurrent at the base; petiole 2 in. long; upper leaves smaller, more deeply cleft, shorter petioled. Inflorescence racemose, terminal on the branches, narrow, erect, 6-10 in. long; branchlets short, bearing dense-flowered dichotomous cymes of 10-15 shortly pedicelled flowers; bracteoles minute, green. Calyx very small; tube subglobose, hispidulous with stellately spreading hairs; dorsal sepal linear-oblong, puberulous, nearly as long as the corolla-tube below its flexure; lateral sepals about half as long; two anticus segments small, linear, obtuse. Corolla bright blue, ½ in. long; tube suddenly deflexed a little above the short base, then ascending and again deflexed, forming a sub-campanulate laterally compressed throat; upper lip reflexed, obovate, with 4 short broad rounded lobes; lower lip rather longer, cymbiform, subacute.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000-7000 ft., *Whyte!* between Mpata and Tanganyika Plateau, 2000-3000 ft., *Whyte!* and cultivated specimen!

61. **C. Marquesii**, *Briquet in Ann. Jard. Genève*. ii. (1898) 239. A shrub, with ascending branches, clothed with crisped hairs. Leaves petioled, broadly ovate, 2–4 in. long, acuminate, membranous, dull green and pubescent above, clothed with grey tomentum beneath, membranous. Cymes compound, 10–15-flowered, forming long lax racemose panicles; pedicels long, clothed with crisped hairs and stalked glands; bracts ovate, deciduous. Flower-calyx $\frac{1}{2}$ – $\frac{1}{8}$ in. long, clothed with glands and spreading hairs; upper tooth ovate, violet; lateral teeth short, narrow, obtuse; lower longer, acute, connate nearly to the apex. Corolla violet, protruding nearly 1 in. from the throat of the calyx. Stamens included. Style exserted.—Henriques in *Bolet. Soc. Brot.* xvi. 70.

Lower Guinea. Angola: in the valleys of the Kuango and Cuillo (? Kuilu) Rivers, *Marques*, 191.

62. **C. aconitiflorus**, *Welw. ex Hiern in Cat. Afr. Pl. Welw.* i. 866. A tall much-branched herb, 3–4 ft. high, with square glabrous stems and ascending branches. Leaves long-petioled, oblong, membranous, crenate, glabrous, cuneate and entire at the base, the lower 3–4 in. long, $1\frac{1}{2}$ –2 in. broad at the middle. Branches each bearing at the end a long lax narrow panicle, with several flowers crowded at the end of the short erecto-patent branchlets; pedicels very short; bracts minute. Calyx campanulate, pubescent, $\frac{1}{2}$ – $\frac{1}{8}$ in. long; teeth ovate, small, subequal. Corolla $\frac{1}{2}$ in. long; tube slender, much longer than the calyx.

Lower Guinea. Angola: province of Huilla; at Lopollo, *Welwitsch*, 5495!

63. **C. Briquetii**, *Baker*. A tall branched herb, with green glabrescent stems. Leaves petioled, oblong-lanceolate, 2–3 in. long, 1 – $1\frac{1}{2}$ in. broad, acuminate, narrowed to the base, serrate, membranous, green and glabrous on both surfaces. Inflorescence racemose, long, dense at the middle; whorls many-flowered; cymes shortly peduncled, not umbellate; pedicels $\frac{1}{8}$ in. long. Calyx in flower $\frac{1}{2}$ lin. long, in fruit much larger; upper tooth ovate, decurrent; lateral teeth orbicular; lower acuminate, connate in the lower half. Corolla protruded $\frac{1}{3}$ in. from the throat of the calyx; lower lip $\frac{1}{8}$ – $\frac{1}{5}$ in. long. Stamens not exserted.—

C. Schweinfurthii, *Briquet in Engl. Jahrb.* xix. 181, not of *Vatke*.

Nile Land. British East Africa: Bongo territory, *Schweinfurth*, 2490!

64. **C. montanus**, *Gürke in Engl. Jahrb.* xix. 218. Stems branched, pubescent, $1\frac{1}{2}$ –2 ft. long. Leaves oblong or ovate-oblong, 1 – $1\frac{1}{2}$ in. long, the upper sessile, the lower shortly stalked, acute, rounded or narrowed to the base, crenate, pubescent on both sides, dotted with black glands beneath. Inflorescence racemose, lax; cymes long-peduncled, 3–5-flowered; bracts broadly ovate; pedicels $\frac{1}{8}$ – $\frac{1}{5}$ in. long. Fruit-calyx $\frac{1}{6}$ in. long, glandular-pubescent outside, naked on the throat inside; upper tooth round-ovate, obtuse; lateral teeth rather shorter, lanceolate, acuminate; lower longer, almost subulate.

Upper Guinea. Cameroons, near Buea, 7000 ft., *Preuss*, 1012.

65. **C. leucophyllus**, *Baker in Kew Bulletin*, 1895, 292. Stem perennial, long, erect, clothed with white tomentum. Leaves shortly petioled, oblong, subacute, cuneate at the base, the lower 3–4 in. long, crenate, clothed thinly with white tomentum on the face, densely beneath. Cymes many-flowered, distinctly peduncled, forming a panicle 1 ft. long; pedicels short, pubescent; bracts minute, deciduous. Calyx pubescent, $\frac{1}{4}$ in. long; tube campanulate; teeth ovate, acute, the upper one largest. Corolla 12–15 lin. long; tube decurved and dilated in the upper half; upper lip small, erect; lower much larger, concave. Stamens reaching the tip of the lower lip.

Mozamb. Dist. British Central Africa: near Lake Moero, *Carson*, 26 of 1894 collection!

66. **C. membranaceus**, *Briquet in Engl. Jahrb.* xix. 182. A slender herb, with pubescent branches. Leaves with a winged petiole, ovate-oblong, 4–5 in. long, acuminate, narrowed to the decurrent base, regularly crenate, very thin, green on both surfaces, pubescent only on the main veins. Inflorescence racemose, $\frac{1}{2}$ ft. long; whorls distant; peduncles of the lower $\frac{1}{3}$ – $\frac{1}{2}$ in. long; pedicels $\frac{1}{12}$ – $\frac{1}{8}$ in. long; bracts deciduous. Calyx in flower $\frac{1}{2}$ lin. long; upper tooth ovate, all the others acuminate. Corolla protruding $\frac{1}{3}$ – $\frac{1}{2}$ in. from the throat of the calyx; upper lip small; lower $\frac{1}{4}$ in. long. Stamens not exerted.

Lower Guinea. Angola: Cissacala (? Sacalla) on the River Kuango, *Mechow*, 554.

67. **C. mechowianus**, *Briquet in Engl. Jahrb.* xix. 183. A tall herb, with green or reddish branches, clothed with deciduous jointed hairs. Leaves petioled, broadly ovate, $1\frac{1}{2}$ in. long, obtuse, truncate at the base, dentate, dotted with black glands, green and glabrous on both surfaces except on the main veins. Inflorescence racemose, 2–3 in. long; peduncles of the lower whorls $\frac{1}{3}$ in. long; pedicels $\frac{1}{8}$ in. long; bracts deciduous. Flower-calyx very small; upper tooth ovate-lanceolate, lower teeth deltoid. Corolla blue, protruding $\frac{1}{3}$ – $\frac{1}{2}$ in. from the throat of the calyx; upper lip minutely 3-lobed; lower $\frac{1}{5}$ in. long. Stamens usually included.

Lower Guinea. Angola: Pungo Andongo, *Mechow*, 123.

68. **C. eetveldeanus**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 73. A tall herb, with pubescent branches. Leaves with a long winged petiole, ovate-deltoid, 1 in. long, acute, closely crenate, truncate at the base, dark green with scattered hairs above, grey-green and densely glandular-pubescent beneath. Panicle 6–8 in. long; axis of cymes above 1 in. long; pedicels $\frac{1}{12}$ – $\frac{1}{6}$ in. long; bracts small deciduous. Calyx finally $\frac{1}{6}$ in. long, glabrescent, with black sessile glands; upper tooth broadly ovate, as long as the tube; lower teeth small, acuminate. Corolla very small; lower lip $\frac{1}{4}$ in. long.—*De Wild. & Durand, Ill. Fl. Congo*, i. t. 25.

South Central. Congo Free State: near Mtowa on Lake Tanganyika, *Descamps*.

69. **C. concinnus**, *Baker*. Stems slender, erect, fragile, shortly pubescent. Leaves petioled, ovate, crenate, membranous, truncate at the base, $1\frac{1}{2}$ in. long, shortly pubescent. Panicle very lax, terminal, $\frac{1}{2}$ ft. long; cymes lax, peduncled; pedicels short. Fruit-calyx $\frac{1}{6}$ in. long; tube campanulate; teeth small; upper tooth ovate; lower teeth lanceolate. Corolla $\frac{1}{3}$ in. long; lower lip longer than the tube.—*Germanea concinna*, Hiern in Cat. Afr. Pl. Welw. i. 861.

Lower Guinea. Angola: province of Pungo Andongo, 2400–3800 ft., *Welwitsch*, 5533!

70. **C. tenuicaulis**, *Hook. f. in Journ. Linn. Soc.* vii. 211. Stems annual, slender, pubescent, erect, much branched, 1 ft. long. Leaves petioled, ovate, crenate, pubescent, moderately firm, $\frac{1}{2}$ –1 in. long. Panicle $\frac{1}{2}$ ft. long or more, very lax, terminal; cymes lax, peduncled; pedicels short, pubescent. Fruit-calyx pubescent, $\frac{1}{8}$ in. long; upper tooth ovate, small; lateral teeth small cusps; lower larger cusps. Corolla $\frac{1}{3}$ in. long; lower lip longer than the tube.—*Engl. Hochgebirgsfl. Trop. Afr.* 361.

Upper Guinea. Cameroons: Cameroon Mountain, 7000 ft., *Mann*, 1939!

71. **C. cunenensis**, *Baker*. A perennial, with firm slender densely pubescent stems. Leaves petioled, ovate, acute, crenate, small, densely pubescent. Panicles terminal, very lax; lower cymes few-flowered, distinctly peduncled; pedicels short. Flower-calyx pubescent, $\frac{1}{8}$ in. long; upper tooth small, ovate; lateral teeth small cusps; lower large cusps. Corolla $\frac{1}{2}$ in. long; lower lip as long as the tube.

Lower Guinea. Angola: near the River Cunene, *Johnston*!

72. **C. viridis**, *Briquet in Engl. Jahrb.* xix. 181. A tall herb, with green glabrescent branches. Leaves with a long petiole, ovate, $1\frac{1}{2}$ –2 in. long, acute or acuminate, truncate or slightly cordate at the base, irregularly crenate, green and glabrescent on both surfaces. Inflorescence racemose, reaching 8 in. long; cymes many-flowered, lower distinctly peduncled; pedicels $\frac{1}{5}$ in. long; bracts deciduous. Fruit-calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long; upper tooth ovate; lateral teeth short, minutely cuspidate; lower acuminate. Corolla protruding $\frac{1}{4}$ in. from the throat of the calyx; upper lip very small; lower large. Stamens included or slightly exerted.

South Central. Congo Free State: Lunda; Mussumba, *Pogge*, 365.

73. **C. shirensis**, *Gürke in Engl. Jahrb.* xix. 216. A perennial herb, with densely pubescent branches. Leaves petioled, broadly ovate, membranous, 2–3 in. long, acuminate, rounded at the base, deeply crenate, nearly glabrous above, pubescent beneath. Cymes many-flowered, very compound, forming a long narrow panicle; bracts small, deciduous; rhachis and pedicels very hairy, the latter $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Fruit-calyx hairy, $\frac{1}{6}$ in. long; upper tooth ovate; lateral teeth shorter, oblong, obtuse; lowest acute, connate nearly to the apex.—*Plectranthus glandulosus*, Britten in Trans. Linn. Soc. ser. 2, Bot. iv. 37, not of Hook. f.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, *Whyte*! and without precise locality, *Buchanan*, 376 and 602 of 1891 collection!

74. **C. scandens**, *Gürke in Engl. Jahrb.* xix. 221. Stems scandent, pubescent, much-branched; branches slender, divaricate. Leaves long-petioled, round-ovate, membranous, $1\frac{1}{2}$ –2 in. long, acute, rounded at the base, deeply crenate, pubescent on both sides. Inflorescence racemose, secund, dense, long-peduncled; cymes sessile, 2–3-flowered; bracts minute, ovate-lanceolate; pedicels short, pubescent like the calyx. Fruit-calyx $\frac{1}{8}$ in. long; teeth subequal, lanceolate-deltoid. Corolla blue.

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, 4000 ft., *Holst*, 9119! 9120A! Kilimanjaro: at Marangu, 4500 ft., *Volkens*, 1431!

75. **C. dissitiflorus**, *Gürke in Engl. Jahrb.* xix. 217. A perennial herb, with slender stems 3–4 ft. long and glandular-pubescent branches. Leaves long-petioled, ovate-rhomboid, membranous, 2– $2\frac{1}{2}$ in. long, cuneate at the base, crenate, glabrous above, pubescent and gland-dotted beneath. Inflorescence racemose, simple, terminal, very lax; cymes compound, 5–7-flowered; pedicels long, glandular-pubescent; bracts ovate, persistent, foliaceous. Calyx in flower $\frac{1}{5}$ in., in fruit above $\frac{1}{3}$ in. long, pubescent, naked inside at the throat; upper tooth broadly ovate, acute, its edges slightly decurrent; lateral teeth shorter, lanceolate, acuminate; lower long, linear. Corolla violet, with a slender tube longer than the calyx.

Upper Guinea. Cameroons: between Buea and Mimbia, 3000 ft., *Preuss*, 1055!

76. **C. Preussii**, *Gürke in Engl. Jahrb.* xix. 219. Stems 6–7 ft. long, branched, pubescent. Leaves long-petioled, broadly ovate, membranous, about 5 in. long, 3 in. broad, acuminate, rounded or narrowed to the base, deeply toothed, quite glabrous on both sides, dotted with black glands below. Inflorescence racemose, lax; whorls remote; cymes long-stalked, 5–9-flowered; bracts ovate, acuminate; pedicels long. Calyx pubescent, $\frac{1}{8}$ in. long in fruit, naked inside at the throat; upper tooth broadly ovate, its edges reflexed and rather decurrent; lateral teeth lanceolate-deltoid; lower deltoid, acute, connate, finally inflexed. Corolla blue.

Upper Guinea. Cameroons: near Buea, 2000–3000 ft., *Preuss*, 569, 691; and without precise locality, *Dusén*, 309.

77. **C. punctatus**, *Baker in Kew Bulletin*, 1895, 291. A perennial herb, with long stout pubescent stems. Leaves ovate, acute, broadly rounded at the base, 3–4 in. long, inciso-crenate, membranous, green and pubescent on both surfaces, copiously dotted with black glands beneath; petiole long. Cymes with an elongated pubescent axis, forming an ample panicle $\frac{1}{2}$ ft. long, 2 in. diam.; pedicels moderately long, ascending; bracts obsolete. Calyx finally $\frac{1}{6}$ in. long; tube very short, densely pilose; teeth ovate, the upper the longest. Corolla $\frac{3}{4}$ in. long; tube decurved and dilated in the upper half; upper lip small, erect; lower large, deeply concave. Stamens reaching the tip of the lower lip.

Mozamb. Dist. British Central Africa: Moero Plateau, south-west of Lake Tanganyika, *Carson*, 25 of 1894 collection!

16. **NEOMULLERA**, Briquet in Engl. Jahrb. xix. 186, t. 3, Fig. B.

Calyx declinate; tube at first campanulate, becoming much larger and ventricose; upper tooth larger, ovate, the others smaller, deltoid. Corolla with a long decurved tube, cylindrical in the lower half, dilated upwards; upper lip small, erect; lower larger, deeply concave. Stamens 4, didynamous, declinate; filaments united in the lower half; anthers oblong, with parallel cells. Style long, declinate, bifid at the tip. Nucules ovoid, smooth.

Endemic. Monotypic.

1. **N. Welwitschii**, Briquet, *l. c.* A tall herb, with long spreading glabrous branches. Leaves with a very long petiole, ovate, membranous, crenate, the lower 5–6 in. long, slightly pubescent. Panicle long, very lax, formed of shortly peduncled lax compound cymes; pedicels long, erecto-patent; bracts obsolete. Fruit calyx $\frac{1}{8}$ – $\frac{1}{5}$ in. long. Corolla-tube 3–4 times the length of the calyx; lower lip deeply concave, shorter than the tube. Stamens and style included.—Hiern in Cat. Afr. Pl. Welw. i. 865.

Lower Guinea. Angola; Pungo Andongo, *Welwitsch*, 5544!

17. **ENGLERASTRUM**, Briquet in Engl. Jahrb. xix. 178, t. 3, Fig. A.

Calyx-tube campanulate, slightly declinate; teeth ovate, subequal. Corolla-tube funnel-shaped; upper lip small, with 3 rounded lobes; lower lip much larger, deeply concave. Stamens 4, didynamous, declinate; filaments united in the lower half; anther-cells parallel. Style long, declinate; apex deeply and equally bifid. Nucules smooth.

Endemic. Monotypic.

1. **E. Schweinfurthii**, Briquet, *l. c.* A much-branched erect annual herb; branches clothed with fine spreading hairs. Leaves very shortly petioled, ovate, membranous, crenate, 1 in. long. Whorls 1–2-flowered, forming copious lax peduncled racemose cymes in the axils of the leaves; pedicels very short; bracts minute, linear. Calyx $\frac{1}{2}$ in. long, finely glandular-pubescent, scarcely at all accrescent; teeth longer than the tube. Corolla-tube 3 times the length of the calyx; lower lip shorter than the tube. Stamens reaching to the tip of the lower lip.

Nile Land. British East Africa: Bongo; Adda, *Schweinfurth*, 2532.

18. **CAPITANYA**, Schweinf. ex Gürke in Engl. Jahrb. xxi. 105, t. 1

Calyx campanulate, very accrescent; lobes 5–6, orbicular, imbricate, the lower shorter than the upper. Corolla-tube cylindrical, as long as the calyx, abruptly deflexed near the tip; upper lip short, orbicular; lower much larger, concave. Stamens 4, declinate, didynamous, as

long as the lower lip of the corolla; filaments united towards the base; anthers oblong, with parallel cells; style shortly bifid at the apex; lobes spreading. Nucules ovoid, smooth.

Endemic. Monotypic.

1. **C. otostegioides**, *Gürke in Eng. Jahrb.* xxi. 106. A low fleshy undershrub, clothed with grey pubescence, with decumbent main stems and ascending flowering branches. Stem-leaves in distant pairs, obovate-cuneate, shortly petioled, obtuse, crenate, about 1 in. long, fleshy, clothed with grey pubescence on both surfaces. Whorls 6-flowered, aggregated in a lax terminal racemose panicle 3-4 in. long; pedicels as long as the flower-calyx; bracts minute. Calyx in the flowering stage $\frac{1}{6}$ in., finally $\frac{1}{2}$ in. long and broad. Corolla more than twice as long as the flowering calyx.

Nile Land. Abyssinia: near Qualamat in the Upper Lebka Valley, 2000-5800 ft., *Müller-Prosko-Capitany, Heuglin*. Somaliland: without precise locality, *Ghika*.

Mozamb. Dist. German East Africa: Kilimanjaro Region: in the Steppe between Ugweno Mountain and the Papyrus swamp, 2300 ft., *Volkens*, 492.

19. ANISOCHILUS, Wall.; Benth. et Hook. f. Gen. Plant. ii. 1177.

Calyx-tube campanulate; upper tooth large, oblong, concave, deflexed; 4 lower teeth very short. Corolla-tube longer than the calyx, deflexed at the middle, with a funnel-shaped throat; limb bilabiate; upper lip short; lower much longer, incurved, deeply concave. Stamens 4, didynamous, deflexed; filaments filiform, shortly connate at the base in the African species; anther-cells confluent. Disk glandular. Style shortly bifid. Nucules ovoid, smooth.—Herbs or undershrubs. Leaves sometimes fleshy. Whorls aggregated into dense spicate panicles. Flowers small.

Species about 15, all but one East Indian.

1. **A. africanus**, *Baker ex Scott-Elliot in Journ. Linn. Soc.* xxx. 94. A perennial herb 4 ft. high, with erect stems and densely shortly pubescent branches. Leaves distant, nearly sessile, oblong-lanceolate, crenate, subcoriaceous, subscabrous above, densely pubescent with raised veinlets beneath, the lower 4-5 in. long. Panicles very dense, sparingly branched, peduncled, cylindric, the end one 3-4 in. long; pedicels obsolete. Fruit-calyx $\frac{1}{6}$ in. long; upper tooth oblong, concave, deflexed, much longer than the tube; 4 lower teeth suborbicular. Corolla $\frac{1}{4}$ in. long. Stamens shortly connate at the base.—*Briquet in Bull. Soc. Bot. Belg.* xxxvii. 65. *A. Engleri*, *Briquet in Engl. Jahrb.* xix. 190.

Upper Guinea. Sierra Leone: near the Loma burn, on alluvial soil, *Scott-Elliot*, 5033!

Lower Guinea. Lower Congo: Stanley Pool, *Hens*, 886.

South Central. Congo Free State: on the banks of the Upper Lulua River, *Pogge*, 372; between Nyangwe and Kimbundu Mountains, *Pogge*, 1019.

20. **HYPTIS**, Jacq.; Benth. et Hook. f. Gen. Plant. ii. 1178.

Calyx-tube campanulate or oblong; teeth 5, subulate, subequal. Corolla-tube cylindric or slightly ventricose; limb sub-bilabiate; lower lip deflexed, concave, narrowed to the base. Stamens 4, didynamous, declinate; filaments free, filiform; anther-cells confluent. Disk entire or reduced to an anticous gland. Style subentire or shortly bifid. Nucules ovoid or oblong, rarely winged, smooth or dotted.—Annual or perennial herbs. Inflorescence very varied. Corolla small.

Species about 250, all Tropical American, a very few extending to the Old World.

Flowers in globose heads.

Annual 1. *H. brevipes*.
Perennial 2. *H. atrorubens*.

Flowers racemose.

Cymes forming simple whorls 3. *H. spicigera*.
Cymes compound 4. *H. pectinata*.

Flowers in peduncled umbellate cymes 5. *H. suaveolens*.

1. **H. brevipes**, Poit.; Benth. in DC. Prod. xii. 107. Annual. Stem erect, branched, pubescent, 3–4 ft. long. Leaves sessile, oblong-rhomboid, crenate, the upper lanceolate. Flowers in dense globose heads $\frac{1}{2}$ in. diam. on short ascending peduncles from the nodes all down the stem; outer bracts lanceolate, as long as the flowers. Calyx $\frac{1}{8}$ in. long; tube short, campanulate; teeth subulate, twice as long as the tube. Corolla scarcely longer than the calyx.—Benth. in Hook. Niger Fl. 489; Oliv. in Trans. Linn. Soc. xxix. 139; Durand & Schinz, Études Fl. Congo, i. 229; Briquet in Bull. Soc. Bot. Belg. xxxvii. 61. *Mesosphaerum brevipes*, O. Kuntze, Rev. Gen. Pl. i. 525; Hiern in Cat. Afr. Pl. Welw. i. 872. *H. lanceifolia*, Schumacher; Benth. l. c.

Upper Guinea. Senegambia, Leprieur! Guinea, Thonning! Sierra Leone: Regent, Scott-Elliot, 3969! near Kambia, on the River Scarcies, Scott-Elliot, 4348! Lagos, Rowland! Millen! Niger Territory: Nupe, Barter, 1130! Lower Niger; Attah, Vogel, 71! Niger Delta; Brass, Barter, 1284! Cameroons: Efulen, Bates, 215! Bipinde, Zenker, 1307! Fernando Po, Vogel, 22! Barter!

Nile Land. British East Africa: Uganda, Scott-Elliot, 7343! Madi, Speke & Grant!

Lower Guinea. Lower Congo: on islands near Ponto de Lenha, Naumann; Stanley Pool, 950 ft., Hens, B92! and without precise locality, Cabra, 78, Dupuis. Angola! province of Pungo Andongo, Welwitsch, 5576! 5599!

South Central. Monbuttu, Schweinfurth, 3302!

Mozamb. Dist. British Central Africa: Nyasaland: Elephant Marsh, Nsesi River, Scott! between Kondowe and Karonga, 2000–6000 ft., Whyte!

Also in Tropical America and Tropical Asia.

2. **H. atrorubens**, Poit.; Benth. in DC. Prod. xii. 108. A perennial, with a slender stem, creeping and rooting at the base, ascending and pubescent upwards. Leaves small, petioled, ovate, crenate, slightly hairy. Flowers in globose heads $\frac{1}{2}$ in. diam., on short

peduncles from the upper nodes. Calyx $\frac{1}{8}$ in. long; tube oblong; teeth subulate, shorter than the tube. Corolla white, dotted with red.—Benth. in Hook. Niger Fl. 489.

Upper Guinea. Senegambia, *Heudelot*, 922! Sierra Leone: Kicham on the River Scarcies, *Scott-Elliott*, 4343! and without precise locality, *Morson*!

Also in Tropical America.

3. **H. spicigera**, *Lam.*; *Benth. in DC. Prod.* xii. 87. Annual. Stem tall, erect, branched, pubescent. Leaves petioled, oblong, with a cuneate base, thin, inciso-crenate, slightly hairy. Whorls many-flowered, forming dense oblong or oblong-cylindric racemose panicles, the end ones 2–4 in. long; pedicels densely hairy; bracts linear. Fruit-calyx $\frac{1}{8}$ – $\frac{1}{5}$ in. long; tube oblong; teeth shorter than the tube. Corolla whitish, scarcely longer than the calyx.—Benth. in Hook. Niger Fl. 489; Durand & Schinz, *Études Fl. Congo*, i. 230; Briquet in *Bull. Soc. Bot. Belg.* xxxvii. 62.

Upper Guinea. Senegal, *Heudelot*, 121! Gambia, *Ingram*! Sierra Leone: Samu District, near Lusenya, *Scott-Elliott*, 4238! Niger Territory: Nupe, *Barter*, 1282!

Nile Land. Upper Sennar: Fazokl, *Kotschy*, 514! British East Africa: Bongo; Gir, cultivated, *Schweinfurth*, 2495! Madi (Gani), *Speke & Grant*!

Lower Guinea. Congo, *Dewèvre*, 862c.

South Central. Congo Free State: Mtowa, on Lake Tanganyika, *Descamps*.

Mozamb. Dist. British Central Africa: Nyasaland; between Kondowe and Karonga, *Whyte*! between Songwe River and Karonga, 1700–2000 ft., *Whyte*, 64!

Also in Tropical America and Madagascar.

Var. (?) *Cienkowskyi*, *Aschers. in Schweinf. Beitr. Fl. Aethiop.* 122. Dwarf. Stem clothed with rigid deflexed hairs. Leaves ovate-oblong, subacute. Racemose panicles twice as long as in the type or more.

Nile Land. Upper Sennar: Fazokl; near Kassan, *Cienkowsky*.

4. **H. pectinata**, *Poit.*; *Benth. in DC. Prod.* xii. 127. Annual. Stems erect, branched, pubescent, 4–6 ft. long. Leaves thin, petioled, small, ovate, crenate, pubescent. Cymes compound, forming racemose panicles. Fruit-calyx pubescent, $\frac{1}{8}$ – $\frac{1}{6}$ in. long; tube oblong; villous at the throat inside; teeth small, setaceous. Corolla not longer than the calyx.—Benth. in Hook. Niger Fl. 489; A. Rich. *Tent. Fl. Abyss.* ii. 186; Schweinf. *Beitr. Fl. Aethiop.* 122; Oliv. in *Trans. Linn. Soc.* xxix. 139; Briquet in *Bull. Soc. Bot. Belg.* xxxvii. 61. *Mesosphaerum pectinatum*, O. Kuntze, *Rev. Gen. Pl.* i. 525; Hiern in *Cat. Afr. Pl. Welw.* i. 873.

Upper Guinea. Sierra Leone: near Kukuma, Scarcies River, *Scott-Elliott*, 4667! Guinea, *Thonning*! Lagos: Abeokuta, *Irving*! Ogbomoshaw, *Barter*, 3392! and without precise locality, *Barter*, 20180! Lower Niger: Idda, *Barter*, 941!

Nile Land. Upper Sennar: Fazokl, *Kotschy*, 544! Eritrea: Ainsaba Valley, near Keren, *Steudner*, 1403! Abyssinia: on mountains near Jelajeranne, *Schimper*, 634! 1559! British East Africa: Madi, *Speke & Grant*, 722!

Lower Guinea. Gaboon: Gaboon River, *Mann*, 1018! Lower Congo: in a marsh at Stanley Pool, *Hens*, 31B! and without precise locality, *Dewèvre*, 76, 532. Angola, *Welwitsch*, 5487, 5530! 5531! 5532! 5560, 5561!

South Central. Congo Free State: Monbuttu; at Kussumbo River, *Schweinfurth*, 3131!

Mozamb. Dist. German East Africa: Umba Valley, *Smith*! Kilimanjaro, 4000–5000 ft., *Johnston*! *Volkens*, 263! Usambara; Mashena, *Holst*, 8786! Khutu; bank of the Mgeta River at Zungomero, *Speke & Grant*! British Central Africa: Nyasaland; Songwe and Karonga, 1700–2000 ft., *Whyte*, 55! Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte*! South Nyika Mountains, 4000–7000 ft., *Whyte*! and without precise locality, *Buchanan*, 399! 435!

A native of Tropical America, widely spread in the warm regions of the Old World.

5. **H. suaveolens**, *Poit.*; *Benth. in DC. Prod.* xii. 126. A much-branched erect annual, with slender pilose stems. Leaves petioled, ovate, the lower cordate, irregularly crenate, thin, pubescent on both surfaces. Cymes few-flowered, umbellate, shortly peduncled, arising from the axils of the reduced upper leaves so as to form a lax terminal panicle. Calyx-tube campanulate, pubescent, strongly 5-ribbed, finally $\frac{1}{8}$ in. long; teeth subulate, equal, shorter than the tube.

Upper Guinea. Sierra Leone: Sherbro Island, *Garrett* in *Scott-Elliot Herb.* 5850!

A native of Tropical America, now widely spread in the Old World.

21. **LAVANDULA**, *Linn.*; *Benth. et Hook. f. Gen. Plant.* ii. 1179.

Calyx cylindric, straight, usually 13-nerved; teeth short. Corolla-tube slender, cylindric; limb oblique, small, obscurely bilabiate. Stamens 4, didynamous, declinate, included in the corolla-tube; filaments free, filiform; anther-cells confluent. Disk confluent with the persistent base of the ovary. Nucules smooth, glabrous.—Perennial herbs or shrubs, fragrant. Leaves simple or decomposed. Panicles spicate; whorls 2- or many-flowered; bracts persistent; upper often large, membranous, highly coloured. Corolla small, blue or lilac.

Species about 30, extending from Madeira to India.

Upper bracts dilated	1. <i>L. dentata</i> .
Upper bracts not dilated.	
Calyx-teeth deltoid	2. <i>L. pubescens</i> .
Calyx-teeth lanceolate	3. <i>L. coronopifolia</i> .

1. **L. dentata**, *Linn.*; *Benth. in DC. Prod.* xii. 145. An erect much-branched undershrub. Stems densely clothed with white tomentum. Leaves sessile, linear, pinnatifid. Panicles oblong, 1–2 in. long, on a long stiffly erect peduncle; lower bracts orbicular-cuneate; upper large, persistent, ovate, membranous, reddish. Calyx pubescent, $\frac{1}{4}$ in. long; upper tooth dilated into a cordate-ovate membranous appendage; lower minute, deltoid. Corolla-tube as long as the calyx; limb small.—*Engl. Hochgebirgsfl. Trop. Afr.* 363.

Nile Land. Abyssinia: Begemeder; south side of the mountains near Dendera, 10,000 ft., *Schimper*, 624!

Cape Verdes and Madeira, through the Mediterranean region to Arabia.

2. **L. pubescens**, *Decsne.*; *Benth. in DC. Prod.* xii. 147. An erect much-branched perennial herb, with slender square hairy stems. Leaves broad, bipinnatifid, with linear segments. Panicles long, slender; whorls 2-flowered; bracts ovate, $\frac{1}{8}$ in. long; upper not dilated and membranous. Calyx as long as the bract; teeth all small, deltoid. Corolla-tube a little longer than the calyx; limb very small.—Engl. Hochgebirgsfl. Trop. Afr. 363.

Nile Land. Somaliland: Ahl Mountains, 6500 ft., *Hildebrandt*, 854.
Also in Arabia and Upper Egypt.

3. **L. coronopifolia**, *Poir.*; *Benth. in DC. Prod.* xii. 147. An erect much-branched perennial herb, with slender square glabrous branchlets. Leaves sessile, cut down to a narrowly-winged rhachis; segments erecto-patent, linear with revolute edges, simple or pinnatifid. Panicles slender, cylindric, 2–3 in. long, lax downwards; bracts rigid, ovate-lanceolate, the lower as long as the calyx; upper not dilated. Calyx pubescent, $\frac{1}{6}$ in. long; teeth equal, lanceolate. Corolla blue, twice as long as the calyx-tube.

Nile Land. Harnish Island, *Slade!* Nubia: Hor Tamanib, near Suakin, *Lord!* Erkowit Mountain, near Suakin, *Schweinfurth*, 246! Coast-land, *Bent!* Eritrea: Geleb, 6000 ft., *Schweinfurth*, 1076!

Also in Western Asia southward to Arabia, Northern Africa and the Cape Verdes.

22. **ELSHOLTZIA**, Willd.; *Benth. et Hook. f. Gen.* *Plant.* ii. 1181.

Calyx-tube straight, ovoid or campanulate, dilated in fruit; teeth 5, unequal. Corolla-tube cylindric; limb with 5 short slightly unequal rounded lobes. Stamens 4, didynamous, arcuate; filaments free, naked; anther-cells often confluent. Style bifid at the apex. Nucules ovoid or oblong, smooth or rugose.—Herbs or undershrubs. Leaves petioled, crenate. Whorls many-flowered, forming dense or slender spicate panicles; bracts persistent. Corolla small.

Species about 20, mostly Asiatic, mainly Indian.

Leaves cordate-ovate, obtuse	1. <i>E. Carsonii</i> .
Leaves ovate, acute	2. <i>E. Schimperii</i> .
Leaves narrowly lanceolate	3. <i>E. aquatica</i> .

1. **E. Carsonii**, *Baker*. A perennial herb, with long trailing pubescent stems, leafless in the upper half. Leaves cordate-ovate, 2–3 in. long, obtuse, deeply crenate, green and pubescent on both surfaces; petiole long, winged upwards. Whorls of flowers forming dense oblong terminal long-peduncled racemose panicles; bracts foliaceous ovate-cuspidate; pedicels short. Calyx densely pubescent, $\frac{1}{6}$ in. long; tube campanulate; teeth deltoid, unequal, shorter than the tube, the uppermost largest. Corolla twice as long as the calyx.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, south of Lake Tanganyika, *Carson!*

2. **E. schimperi**, *Hochst. in Schimp. Pl. Abyss. Exsicc. No. 1411*. A tall erect perennial herb, with stems pubescent upwards. Leaves large, thin, petioled, ovate, acute, slightly pubescent. Whorls forming dense thick spicate panicles at the end of the stem and from the axils of the upper leaves; bracts orbicular, cuspidate, membranous, ciliate, densely imbricate, $\frac{1}{6}$ in. diam. Flower-calyx $\frac{1}{6}$ in. long; upper tooth oblong, as long as the campanulate tube; 4 lower teeth shorter, ovate. Corolla-tube cylindric, much exserted.—Vatke in *Linnaea*, xxxvii. 325; Engl. *Hochgebirgsfl. Trop. Afr.* 363; Briquet in *Bull. Herb. Boiss.* ii. 133.

Nile Land. Abyssinia: Begemeder; Addi-Abun, 6500 ft., *Schimper*, 755! and without precise locality, *Schimper*, 694! 1411!

3. **E. aquatica**, *C. H. Wright*. Stem herbaceous, fistular, 3 lin. diam., with numerous branches at the nodes. Leaves narrowly lanceolate, irregularly dentate, pubescent on the upper side of the midrib, nerves prominent beneath, 2 in. long, 4 lin. wide. Panicles spicate, terminal on the branches, about 1 in. long, 3 lin. diam.; bracts small, oblong. Calyx campanulate, 1 lin. long, pubescent outside; teeth triangular, acute. Corolla slightly longer than the calyx, pubescent outside in bud, pink; lobes obtuse. Filaments twice as long as the corolla; anthers reniform, dark purple-brown. Nucules smooth.

Mozamb. Dist. Portuguese East Africa: between Unangu and Lake Shirwa, in water, 3000–4000 ft., *Johnson*, 15!

23. **MENTHA**, Linn.; Benth. et Hook. f. *Gen. Plant.* ii. 1182.

Calyx campanulate or cylindric, 10-ribbed, 5-toothed. Corolla-tube funnel-shaped; lobes 4, the upper rather broader, emarginate. Stamens 4, subequal; filaments free; anthers 2-celled. Disk entire, equal. Style shortly bifid. Nucules ovoid, smooth.—Herbs, with toothed leaves. Whorls many-flowered, aggregated in spicate panicles or dispersed and axillary. Stamens dimorphic. Flowers small.

Species about 25, concentrated in the North Temperate zone of the Old World.

Whorls of flowers forming a dense terminal spike . . . 1. *M. sylvestris*.

Whorls of flowers distant, subtended by large leaves . . . 2. *M. Pulegium*.

1. **M. sylvestris**, Linn.; Benth. in *DC. Prod.* xii. 166. A perennial, with erect pubescent stems. Leaves sessile, lanceolate, densely pubescent, obscurely serrate. Whorls many-flowered, aggregated into cylindric terminal spicate panicles 2–3 in. long. Calyx densely pubescent, $\frac{1}{2}$ in. long; teeth lanceolate-deltoid. Corolla-tube as long as the calyx; lobes orbicular.—A. Rich. *Tent. Fl. Abyss.* ii. 187; Engl. *Hochgebirgsfl. Trop. Afr.* 363.

Nile Land. Abyssinia: Tigre; near Adowa, on the banks of the Mai Tera Brook, *Schimper*, 403! Province of Shire, *Quartin-Dillon & Petit*, 15! Begemeder; Anadehr, *Schimper*, 586; Beschilo Valley, near Magdala, *Steudner*, 1421!

Throughout Europe and Western Asia.

2. **M. Pulegium**, *Linn.*; *Benth. in DC. Prod.* xii. 175. A perennial, with slender prostrate much-branched pubescent or nearly glabrous stems. Leaves small, petioled, ovate, crenate. Flowers in distant globose axillary whorls. Calyx $\frac{1}{2}$ in. long; upper teeth deltoid, lower lanceolate. Corolla-tube shortly exerted; lobes small, oblong.—*A. Rich. Tent. Fl. Abyss. ii.* 187; *Engl. Hochgebirgsfl. Trop. Afr.* 364.

Nile Land. Abyssinia: near Adowa, *Schimper*, 141! Mai-Samia, near Adowa, *Rohlf's & Stecker*. Shire, *Quartin-Dillon & Petit*, 13! Addi-Shoa, 3500 ft., *Schimper*, 754; Ataba, *Steudner*, 1406!

Also in Europe, North Africa and Western Asia.

24. **MICROMERIA**, *Benth.*; *Benth. et Hook. f. Gen. Plant.* ii. 1188.

Calyx-tube cylindric, 13–15-nerved; teeth acute, nearly equal. Corolla-tube straight; limb short, bilabiate; upper lip erect, nearly flat; lower patent, 3-lobed. Stamens 4, didynamous, ascending; anthers 2-celled. Disk equal or reduced to an anticous gland. Style bifid at the apex. Nucules small, ovoid or oblong.—Herbs or undershrubs. Leaves entire or crenate. Whorls axillary or crowded into a terminal spicate panicle. Flowers small.

Species 60, spread widely in both hemispheres.

Leaves rigid, entire.

- | | |
|---|---------------------------|
| Leaves ovate or oblong-lanceolate | 1. <i>M. biflora</i> . |
| Leaves lanceolate | 2. <i>M. longiflora</i> . |
| Leaves membranous, crenate | 3. <i>M. abyssinica</i> . |

1. **M. biflora**, *Benth. in DC. Prod.* xii. 220. A much-branched perennial herb, with slender pubescent stems $\frac{1}{2}$ –1 ft. long. Leaves obscurely petioled, rigid, entire, finely pubescent, ovate or oblong-lanceolate, $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Cymes 2–6-flowered, sessile or shortly peduncled in the axils of many produced leaves. Calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long; tube cylindric, pubescent, strongly ribbed; teeth small, lanceolate-deltoid. Corolla-tube shortly exerted, dilated at the throat.—*Hook. f. Fl. Brit. Ind.* iv. 650; *Engl. Hochgebirgsfl. Trop. Afr.* 365. *M. punctata*, *Benth. l. c.*; *Britten in Gregory, Great Rift Valley*, 396. *M. ovata*, *Benth. l. c.* 219. *M. Schimperii*, *Vatke in Linnæa*, xxxvii. 326. *M. Purtschelleri*, *Gürke in Engl. Hochgebirgsfl. Trop. Afr.* 365. *Satureia ovata* and *S. punctata*, *R. Br. in Salt, Abyss. Append.* 64.

Upper Guinea. Cameroons: Cameroon Mountain, 7000–10,000 ft., *Mann*, 1292! 1981! *Johnston*, 39! on open dry plains, *Kalbreyer*, 115!

Nile Land. Nubia: Coast-land, *Bent!* Erkowit Mountain, near Suakin, *Schweinfurth*, 225! Eritrea: Mount Bizen, 6500 ft., *Schweinfurth & Riva*, 1863! Keren, *Steudner*, 1429! Abyssinia: Mount Sholoda, near Adowa, *Schimper*, 12! 45! 1859! *Quartin-Dillon*; Province of Wojerat, *Quartin-Dillon!* Samen; Dugua, *Steudner*, 1435; Debra Eski, *Schimper*, 156; Ghaba, *Steudner*, 1430; Jaja, 6000 ft., *Schimper*, 314; Amba Sea, 7400 ft., *Schimper*, 381; Godofelassi, *Rohlf's & Stecker*; Sassidolosatscha, *Rohlf's & Stecker*; near Janausa, 8400–9400 ft., *Schimper*; near Memsah, *Quartin-Dillon*; Begemededer; near Anadehr, 7800 ft., *Schimper*, 576! Guna Mountain, *Steudner*, 1433, Urahut district, 9700–10,400 ft., *Schimper*, 591!

Erareta Mountain, 10,700 ft., *Schimper*, 765 of 1862 collection; Ankober, *Roth*, 508! between Yenitcha (Jennija) and Sebit, north of Magdala, *Steudner*, 1431; and without precise locality, *Schimper*, 4! 765! 792! *Plowden*! British Somaliland: Darra-as, 5000 ft., *Miss Edith Cole*! Serrut Mountains, near Maid, 5800 ft., *Hildebrandt*, 1564! British East Africa: Ruwenzori, 6000–7000 ft., *Scott-Elliott*, 7765! crater south of Lake Naivasha, 7000–8000 ft., *Thomson*! Machakos, 5000–6000 ft., *Scott-Elliott*, 6617! Kikuyu, *Scott-Elliott*, 6608! Guaso Mairi and Lanjoro, south of Guaso Thegu and at the west foot of Mount Kenia, *Gregory*.

Lower Guinea. Angola: Huilla; Humpata, *Johnston*! Cunene River, *Johnston*!

Mozamb. Dist. German East Africa: Kilimanjaro; at 4000–6000 ft., *Johnston*, 98! 99! 194! between Marangu and Majame, 4500–9000 ft., *Meyer*, 110, 349; at Mue River, above 9000 ft., *Meyer*, 244; Kifinika Volcano, 10,000 ft., *Volkens*, 940! and on the Plateau, 12,600 ft., *Volkens*, 1197! Usambara; Kwa Mshuza, *Holst*, 9079! Lower Plateau north of Lake Nyasa, *Thomson*! Portuguese East Africa: mountains east of Lake Nyasa, *Johnson*! British Central Africa: Nyasaland; Masuka Plateau, 6500–7000 ft., *Whyte*! Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte*! Zomba Plateau, 4800 ft., *Whyte*! Mount Malosa, *Cameron*, 10!

Also in South Africa and India.

2. **M. longiflora**, *Hochst. in Schimp. Pl. Abyss. Exsicc. No. 2192.* A much-branched perennial herb with firm slender trailing stems, pubescent upwards. Leaves nearly sessile, firm, lanceolate, pubescent, entire, the lower $\frac{3}{4}$ –1 in. long. Cymes 3–6-flowered, shortly peduncled in the axils of produced leaves. Calyx densely pubescent, $\frac{1}{6}$ in. long; teeth lanceolate, as long as the tube. Corolla $\frac{1}{2}$ – $\frac{5}{8}$ in. long; tube longer than the calyx, funnel-shaped at the throat.—*M. unguentaria*, *Schweinf. Beitr. Fl. Æthiop.* 124; *Engl. Hochgebirgsfl. Trop. Afr.* 365.

Nile Land. Abyssinia: Samen; mountains near Jaja, 5700 ft., *Schimper*, 2192!

3. **M. abyssinica**, *Benth. in DC. Prod. xii. 224.* A much-branched perennial herb. Stems slender, ascending, finely pubescent, 1–2 ft. long. Leaves distinctly petioled, membranous, ovate, crenate, finely pubescent, the lower 1–1 $\frac{1}{2}$ in. long. Whorls many, distant, sessile, many-flowered, only the lowest subtended by large leaves; pedicels $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Calyx nearly $\frac{1}{4}$ in. long; tube cylindrical, strongly ribbed; teeth small, lanceolate. Corolla-tube not longer than the calyx.—*Avetta* in *Ann. Istit. Bot. Roma*, vi. 60. *Melissa abyssinica*, *Hochst. in Schimp. Pl. Abyss. Exsicc. No. 326*; *Engl. Hochgebirgsfl. Trop. Afr.* 365.

Nile Land. Eritrea: Saganeiti, in Marakhat Valley, 6800–7100 ft., *Schweinfurth & Riva*, 1715! Abyssinia: Mount Sholoda, near Adowa, *Schimper*, 326! 1846; Adowa, *Quartin-Dillon & Petit*! Samen; below Debra Eski, *Schimper*, 159; Ghaba (Geba River?), *Steudner*, 1432; Amba Sea, 6500 ft., *Schimper*, 379; Lotho, 8900 ft., *Schimper*, 415; Shoa; Cora, *Ragazzi*, Let-Marefia, *Ragazzi*; and without precise locality, *Petit*! *Plowden*! *Schimper*, 948! *Roth*, 512! British Somaliland: Serrut Mountains, near Maid, 5200–5800 ft., *Hildebrandt*, 1424!

Mozamb. Dist. German East Africa: Kilimanjaro; at Marangu, 4600 ft., *Volkens*, 268! at 6000 ft., *Johnston*! *Smith*! Usambara; Kwa Mshuza, *Holst*, 9160!

Also in Arabia.

25. **THYMUS**, Linn.; Benth. et Hook. f. Gen. Plant. ii. 1186.

Calyx-tube 10-13-nerved; limb bilabiate. Corolla-tube included or exerted; limb short, obscurely bilabiate; upper lip nearly flat; lower patent, 3-lobed. Stamens 4, equal or obscurely didynamous; filaments filiform; anthers 2-celled. Disk equal. Style shortly bifid. Nucules ovoid or oblong, smooth.—Perennial herbs or undershrubs. Leaves small, usually entire. Whorls in the axils of the leaves or crowded into terminal spicate panicles. Flowers small.

Species 40, concentrated in the Mediterranean region.

Leaves serrate	1. <i>T. serrulatus</i> .
Leaves entire	2. <i>T. Serpyllum</i> .

1. **T. serrulatus**, Hochst.; Benth. in DC. Prod. xii. 203. A much-branched perennial, shrubby at the base, with short decumbent pubescent stems. Leaves lanceolate, sessile, firm, acutely serrate, $\frac{1}{2}$ – $\frac{3}{4}$ in. long, cuneate at the base, ciliate, dotted with conspicuous black glands. Whorls aggregated into dense globose terminal heads with leaves crowded at the base. Calyx $\frac{1}{8}$ in. long; tube oblong; teeth acute, longer than the tube. Corolla twice as long as the calyx. Stamens exerted.—A. Rich. Tent. Fl. Abyss. ii. 188; Engl. Hochgebirgsfl. Trop. Afr. 364.

Nile Land. Abyssinia, at 10,000–11,700 ft.: Aber Mountain, near Adesela, Schimper, 868! Debra Eski, Schimper, 153; Urahut district, on Erareta Mountain, Schimper, 713; Lotho, Schimper, 463.

2. **T. Serpyllum**, Linn.; Benth. in DC. Prod. xii. 200. A perennial, much-branched at the crown of the root, with slender trailing more or less pubescent stems. Leaves sessile, oblong or lanceolate, cuneate at the base, entire, conspicuously dotted with black glands. Whorls crowded into globose terminal heads. Calyx $\frac{1}{2}$ in. long; tube campanulate; teeth of the upper lip short, of the lower long and narrow. Corolla-tube as long as the calyx.—A. Rich. Tent. Fl. Abyss. ii. 188; Hook. f. Fl. Brit. Ind. iv. 649; Engl. Hochgebirgsfl. Trop. Afr. 364.

Nile Land. Eritrea: Mount Bizen, 6500 ft., Schweinfurth & Riva, 1854! Abyssinia: Samen; Ataba, Steudner, 1406! near Enjedcap, Schimper, 1178! and without precise locality, Schimper, 712!

Also in Europe, Western Asia, Himalayas, and Greenland.

26. **CALAMINTHA**, Moench; Benth. et Hook. f. Gen. Plant. ii. 1190.

Calyx tube cylindric, 13-nerved; limb bilabiate; upper lip trifid, lower bifid. Corolla-tube straight; limb bilabiate; upper lip flat or slightly concave; lower patent, bifid. Stamens 4, ascending; upper sometimes imperfect; anther-cells parallel or divergent. Disk equal. Style bifid. Nucules ovoid, smooth.—Herbs or undershrubs. Leaves entire or dentate. Whorls usually axillary, many-flowered. Flowers small or medium-sized.

Species 40, concentrated in the North Temperate zone of both hemispheres.

Whorls of flowers lax, axillary.

Whorls from the upper nodes only.

Leaves flat 1. *C. simensis*.

Leaves with revolute edges 2. *C. Kilimandschari*.

Whorls from nearly all the nodes 3. *C. cryptantha*.

Whorls of flowers condensed into an oblong head 4. *C. paradoxa*.

1. **C. simensis**, *Benth. in DC. Prod.* xii. 230. A much-branched perennial herb, with spreading slender pubescent stems 3–12 in. long. Leaves obscurely petioled, ovate or suborbicular, faintly crenate, pubescent, $\frac{1}{4}$ – $\frac{1}{2}$ in. long. Whorls about 6-flowered, lax, the lower or all subtended by developed leaves; pedicels densely hairy, $\frac{1}{8}$ – $\frac{1}{6}$ in. long. Calyx $\frac{1}{6}$ – $\frac{1}{4}$ in. long; tube cylindric, hairy; teeth small, those of the upper lip lanceolate, those of the lower lip larger, lanceolate-deltoid. Corolla $\frac{1}{3}$ in. long; limb short. Stamens included.—A. Rich. Tent. Fl. Abyss. ii. 190; Engl. Hochgebirgsfl. Trop. Afr. 366; Avetta in Ann. Istit. Bot. Roma, vi. 61 (including var. *obtusifolia*). *Melissa alpina*, var. *simensis*, Hochst. in Schimp. Pl. Abyss. Exsicc. No. 366. *Nepeta Ehlersi*, Schweinf. in Engl. Hochgebirgsfl. Trop. Afr. 368 (name only).

Upper Guinea. Cameroons: Cameroon Mountain, 7000–10,500 ft., *Mann*, 1293! 1302! 2031! Upper Slopes, 8000 ft., *Johnston*, 21! 49! Fernando Po; Clarence Peak, 8,500 ft., *Mann*, 617!

Nile Land. Abyssinia: Samen; on rocks in the middle region of Mount Bachit, *Schimper*, 999! Urahut district, on Erareta Mountain, 9800 ft., *Schimper*, 721! Wojerat district, *Petit*; Shoa; Let-Marefa, *Ragazzi*; Autoto, *Ragazzi*; and without precise locality, *Schimper*, 107! *Roth*, 519!

Mozamb. Dist. German East Africa: Lower Plateau north of Lake Nyasa, *Thomson*! Kilimanjaro, 3000–8000 ft., *Kersten*, *Meyer*.

2. **C. Kilimandschari**, *Gürke in Engl. Hochgebirgsfl. Trop. Afr.* 366. A perennial herb, with slender creeping pubescent stems. Leaves petioled, suborbicular, $\frac{1}{6}$ – $\frac{1}{4}$ in. long, thick, pubescent on both sides, with a revolute obscurely crenate margin. Inflorescence as in *C. simensis*. Calyx $\frac{1}{8}$ – $\frac{1}{5}$ in. long; lower teeth subulate; upper shorter. Corolla twice as long as the calyx.

Mozamb. Dist. German East Africa: Kilimanjaro; near Johannes Gorge, 12,300 ft., *Volkens*, 1194! from Mue River to the limit of vegetation, 9000–13,000 ft., *Meyer*, 234.

3. **C. cryptantha**, *Vatke in Linnæa*, xxxvii. 328. A perennial herb, with slender diffuse pubescent stems 1–1 $\frac{1}{2}$ ft. long. Leaves petioled, thin, broadly oblong with a cuneate base, conspicuously crenate, finely pubescent, $\frac{3}{4}$ –1 in. long. Flowers few in a whorl, produced in the axils of the leaves all down the stem; pedicels pubescent, as long as the calyx. Calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long; teeth small, of the upper lip ovate, of the lower lanceolate. Corolla small and stamens in part sterile in some of the specimens seen.—Engl. Hochgebirgsfl. Trop. Afr. 366.

Nile Land. Abyssinia: Wojerat district, *Quartin-Dillon & Petit*, 2! Samen:

Nori, *Steudner*, 1438; Begemeder; Debra Tabor, 8700 ft., *Schimper*, 1144! Urahut; Erareta Mountain, 11,000 ft., *Schimper*, 722.

4. **C. paradoxa**, *Vatke in Linnaea*, xxxvii. 327. A perennial herb, with many slender ascending hairy stems 1 ft. long. Leaves obscurely petioled, thin, ovate, obtuse, faintly crenate, nearly glabrous, 1-1½ in. long. Whorls condensed into a short oblong terminal spicate panicle. Calyx $\frac{1}{8}$ - $\frac{1}{6}$ in. long; teeth lanceolate-deltoid. Corolla-tube as long as the calyx; limb short.—*Engl. Hochgebirgsfl. Trop. Afr.* 366.

Nile Land. Abyssinia: Begemeder; Debra Tabor, 8600 ft., *Schimper*, 1546!

27. **MERIANDBRA**, Benth.; Benth. et Hook. f. *Gen. Plant.* ii. 1194.

Calyx-tube funnel-shaped, 10-ribbed; limb bilabiate; upper lip 3-toothed; lower bifid. Corolla-tube funnel-shaped; limb with 4 subequal lobes. Perfect stamens 2; anthers with two shortly stipitate cells; posticous stamens represented by 2 small staminodia. Disk equal. Style bifid at the apex. Nucules obovoid-oblong, smooth.—Erect shrubs. Leaves rugose, crenulate. Whorls many-flowered, spaced out or dense. Flowers small.

Species 2, both Indian, one of them also in Africa.

1. **M. bengalensis**, *Benth. in DC. Prod.* xii. 262. A much-branched erect shrub, 3-6 ft. high, with densely pubescent branches. Leaves petioled, oblong-lanceolate, 2-3 in. long, rugose, minutely crenate, with a scent like those of *Salvia officinalis*, but stronger. Whorls very dense, globose, forming long racemose panicles at the end of the branches; lowest bracts as long as the flowers. Calyx densely pubescent, $\frac{1}{6}$ in. long. Corolla white; tube as long as the calyx; limb small.—*A. Rich. Tent. Fl. Abyss.* ii. 191; *Hook. f. Fl. Brit. Ind.* iv. 653; *Engl. Hochgebirgsfl. Trop. Afr.* 367. *Salvia abyssinica*, *R. Br. in Salt, Abyss. Append.* 62. *S. schimperiana*, *Hochst. in Schimp. Pl. Abyss. Exsicc.* No. 1781.

Nile Land. Eritrea: Saganeiti, 7100 ft., *Schweinfurth & Riva*, 1213! Degerra Valley, near Saganeiti, 7100 ft., *Schweinfurth & Riva*, 1254! Abyssinia: on the higher mountains of the Province of Urahut, *Schimper*, 1781! and without precise locality, *Salt, Ruppell*.

Also in Arabia and India, where it is commonly cultivated for its sage-like leaves.

28. **SALVIA**, Linn.; Benth. et Hook. f. *Gen. Plant.* ii. 1194.

Calyx-tube funnel-shaped; limb bilabiate; upper lip entire or 3-toothed; lower lip bifid. Corolla-tube funnel-shaped; limb bilabiate; upper lip concave, entire or emarginate; lower lip spreading, 3-lobed. Stamens 2, arcuate; filaments short; connective forked, one branch only bearing a perfect cell, the other usually a small rudimentary one; 2 minute staminodia often present. Disk usually produced on one side. Style bifid at the apex. Nucules ovoid-triangular, smooth.—Herbs or

shrubs. Leaves often rugose, simple or lobed or rarely compound. Whorls of flowers usually distinct; bracts small or large. Flowers often large and brightly coloured.

Species 450, cosmopolitan.

Shrub, with woody branches 1. *S. somalensis*.

Perennial herbs.

Bracts large.

Corolla three times the length of the calyx . . . 2. *S. Fleckii*.

Corolla half as long again as the calyx . . . 3. *S. Schimperii*.

Bracts small.

Upper lip of the calyx subentire 4. *S. nudicaulis*.

Upper lip of calyx tricuspidate.

Stem leaves entire 5. *S. nilotica*.

Stem leaves lyrate 6. *S. Hochstetteri*.

1. **S. somalensis**, *Vatke in Linnæa*, xliii. 93. A shrub 6–7 ft. high, with virgate woody pubescent branches. Leaves oblanceolate-oblong, sessile, subentire, rugose, acute or obtuse, $2\frac{1}{2}$ –3 in. long, finely pubescent, narrowed gradually to the base. Whorls 6–8-flowered, forming long lax simple racemose panicles; bracts small, green; pedicels very short, densely hairy. Calyx $\frac{1}{3}$ in. long; tube densely hairy, funnel-shaped; lips shorter than the tube, upper shortly tridentate, lower with two large lanceolate-deltoid teeth. Corolla blue, twice as long as the calyx; lips short; upper ovate; lower broad, deflexed, 3-lobed.—Engl. Hochgebirgsfl. Trop. Afr. 367.

Nile Land. British Somaliland: Serrut Mountains, near Maid, 4800–5800 ft., *Hildebrandt*, 1419!

2. **S. Fleckii**, *Gürke in Bull. Herb. Boiss.* vi. 551. Stem herbaceous, simple, erect, pubescent. Leaves long-petioled, ovate-oblong, 3–4 in. long, obtuse, subcordate at the base, crenate, bullate, hairy on both surfaces. Bracts suborbicular or cordate-ovate, the lower $\frac{1}{3}$ in. long; pedicels short. Calyx pubescent, $\frac{1}{3}$ in. long; teeth of the upper lip very small and acute, of the lower lip acuminate. Corolla three times the length of the calyx.

Lower Guinea. German South-west Africa: Hereroland, *Fleck*, 168A. Great Namaqualand; Oakuk-Stolzenfels, *Pfeil*, 78.

3. **S. Schimperii**, *Benth. in DC. Prod.* xii. 282. A perennial herb, with stout erect much-branched stems, clothed with white tomentum. Leaves oblong or ovate-oblong, petioled, obscurely crenulate, green and slightly tomentose above, densely coated with white tomentum beneath, the lower 4–5 in. long. Whorls few-flowered, arranged in long lax racemose panicles; bracts large, broadly ovate, cuspidate, persistent, white with green veins. Calyx above $\frac{1}{2}$ in. long, pubescent; tube funnel-shaped; lips short; teeth lanceolate-deltoid. Corolla white, half as long again as the calyx; upper lip $\frac{1}{3}$ in. long; lower shorter, deflexed.—A. Rich. Tent. Fl. Abyss. ii. 192; Engl. Hochgebirgsfl.

Trop. Afr. 367. *S. hypoleuca*, Hochst. in Schimp. Pl. Abyss. Exsicc. No. 1916.

Nile Land. Abyssinia: Tigre; at the village of Hazabo, near Axum, 7000–8000 ft., *Schimper*, 1916! Samen; Doqua, *Steudner*, 1394! Province of Wojerat, *Quartin-Dillon & Petit*, 18! Shoa; Aliu Amba, near Ankober, *Roth*, 526! and without precise locality, *Schimper*, 3!

Also in Arabia.

4. ***S. nudicaulis***, *Vahl*; *Benth. in DC. Prod.* xii. 294. A perennial herb, with most of the leaves concentrated in a basal rosette, and with a short slightly pubescent stem. Leaves linear-oblong, thick, rugose, crenulate, $1\frac{1}{2}$ –2 in. long, densely pubescent beneath. Whorls about 6-flowered, forming a lax racemose panicle; bracts small; pedicels very short. Calyx very hairy, $\frac{1}{4}$ in. long; lips as long as the tube; upper entire or emarginate; lower deeply bifid. Corolla-tube as long as the calyx; upper lip arched, $\frac{1}{4}$ in. long; lower much shorter, deflexed.—Engl. Hochgebirgsfl. Trop. Afr. 367. *S. abyssinica*, Hochst. in Schimp. Pl. Abyss. Exsicc. No. 160; A. Rich. Fl. Abyss. ii. 192. *S. congesta*, A. Rich. Tent. Fl. Abyss. ii. 194; Vatke in Linnæa, xliii. 93.

Nile Land. Eritrea: Habab, *Hildebrandt*, 436, near Saganeiti, 6500–7000 ft., *Schweinfurth & Riva*, 811! 852! near Acrur, 6100 ft., *Schweinfurth*, 1003! Abyssinia: Tigre; near Adowa, *Schimper*, 160! Mai Samia, near Adowa, *Rohlf's & Stecker*, Abba Gerima, near Adowa, 6800 ft., *Schimper*, 642; Samen; Bachit Mountain, *Schimper*, 99; Katz, *Rohlf's & Stecker*; Urahut district, *Schimper*, 597, Erareta Mountain, 11,300 ft., *Schimper*; and without precise locality, *Quartin-Dillon & Petit*, 21! 23! *Schimper*, 855! 857! British Somaliland; Serrut Mountains, near Maid, 5800 ft., *Hildebrandt*, 1420! and without precise locality, *Miss Edith Cole! Mrs. Lort-Phillips!*

Also in Arabia.

Var. *nubia*, Baker. Stem longer, bearing several pairs of oblong or oblong-lanceolate leaves.—*S. nubia*, Ait.; *Benth. in DC. Prod.* xii. 295.

Nile Land. Nubia, *Forster!* Eritrea: Bogos; Ainsaba Valley, *Steudner*, 1387! Abyssinia: on Mount Bachit and in fields near Enjedcap, *Schimper*, 541! and without precise locality, *Schimper*, 859!

5. ***S. nilotica***, *Vahl*; *Benth. in DC. Prod.* xii. 350. A perennial herb, with long erect pubescent branched stems. Lower leaves petioled, lyrate, $\frac{1}{2}$ ft. long, thin, pubescent; upper sessile, ovate, entire. Whorls about 6-flowered, forming long lax racemose panicles; bracts small, green, ovate; pedicels short. Calyx $\frac{1}{3}$ in. long; tube funnel-shaped, pubescent; lips shorter than the tube; upper with 3 small cusps; lower with 2 lanceolate-deltoid teeth. Corolla pale blue; tube as long as the calyx; upper lip oblong, concave, $\frac{1}{8}$ in. long; lower very small, broad, with reflexed edges and an emarginate central lobe.—A. Rich. Tent. Fl. Abyss. ii. 193; Engl. Hochgebirgsfl. Trop. Afr. 368; Avetta in Istit. Bot. Roma, vi. 60. *S. abyssinica*, Jacq. Ic. t. 6. *S. pungens*, Hochst. in Schimp. Pl. Abyss. Exsicc. No. 565.

Nile Land. Eritrea: Marakhat Valley, near Saganeiti, 6800–7000 ft., *Schweinfurth & Riva*, 1683! Abyssinia: Samen; near Enjedcap, *Schimper*, 565! Jebel-Gerara and Sokota, *Rohlf's & Stecker*; Shoa; Antoto, *Ragazzi*; and without precise locality, *Schimper*, 856! *Roth*!

Mozamb. Dist. German East Africa: Kilimanjaro, 6000–8700 ft., *Johnston!* *Volkens*, 1331! Usambara: Mlalo, *ex Gürke*.

6. **S. Hochstetteri**, *Baker*. A perennial herb, with short erect pubescent stems. Leaves (both basal and those of the stem except the uppermost) deeply pinnatifid, thin, slightly pubescent; basal distinctly petioled; upper stem-leaves small, ovate, simple, sessile. Whorls 6-flowered, forming long lax racemose panicles; bracts very small; pedicels very pubescent. Calyx under $\frac{1}{4}$ in. long; lips short; upper with 3 cusps; lower with 2 lanceolate-deltoid teeth. Corolla-tube as long as the calyx; lips very short, upper oblong.—*S. scabra*, Hochst. in Schimp. Pl. Abyss. Exsicc. No. 276; A. Rich. Tent. Fl. Abyss. ii. 193, not of Thunb. *S. nilotica*, var. *scabra*, Vatke in Linnæa, xxxvii. 329; Engl. Hochgebirgsfl. Trop. Afr. 368.

Nile Land. Abyssinia: Tigre; near Adowa, by streams in low-lying valleys, *Schimper*, 276! Dembea; Jenda, *Steudner*, 1390! Shoa; Ankober, *Roth*!

Imperfectly known species.

7. **S. Turdi**, *A. Rich. Tent. Fl. Abyss. ii. 194*. A shrub, with tomentose virgate branches. Leaves petioled, ovate, crenate, usually obtuse, with a cuneate entire base, soft and tomentose on both sides. Flowers aggregated in the axils of the leaves; whorls with a short common peduncle; bracts linear. Calyx-tube funnel-shaped, villous; upper lip longest, broader than long, very obtuse; lower obsolete and unequally 4-toothed.

Included in A. Richard's Tent. Fl. Abyss., without any locality or name of collector.

The American *S. coccinea*, Linn., was found by Moller in the Island of St. Thomas, and *S. pseudo-coccinea*, Jacq., by Welwitsch in Angola.

29. **NEPETA**, Linn.; Benth. et Hook. f. Gen. Plant. ii. 1199.

Calyx-tube cylindric, with 15 distinct ribs; teeth 5, subequal. Corolla-tube dilated at the throat; limb bilabiate; upper lip concave; lower 3-lobed, the central lobe the largest. Stamens 4, didynamous, arcuate; upper pair the longest; anther-cells 2, divergent. Disk equal or produced on the lower side. Style shortly bifid. Nucules ovoid, obtuse, small.—Annual or perennial herbs. Leaves usually ovate, crenate, sessile. Whorls many-flowered, forming long racemose panicles at the top of the stem.

Species 120, concentrated in India and the North Temperate zone of the Old World.

Calyx $\frac{1}{8}$ – $\frac{1}{5}$ in long.

Leaves not rigid.

Calyx-teeth deltoid 1. *N. petitiana*.

Calyx-teeth lanceolate 2. *N. azurea*.

Leaves rigid, with veins raised beneath 3. *N. robusta*.

Calyx $\frac{1}{4}$ in. long.

Corolla-tube as long as the calyx 4. *N. biloba*.

Corolla-tube longer than the calyx 5. *N. ballotæfolia*.

1. ***N. petitiana***, *Baker*. A perennial herb, with erect pubescent stems 2 ft. long. Leaves sessile, ovate, crenate, glabrescent above, densely pubescent beneath, the lower 1 in. long, the upper growing gradually shorter. Inflorescence racemose, lax; lower whorls subtended by large leaves. Calyx $\frac{1}{8}$ in. long; tube cylindric, curved, pubescent; teeth small, deltoid. Corolla-lips small.

Nile Land. Abyssinia; Province of Wojerat, *Quartin-Dillon & Petit*, 19!

2. ***N. azurea***, *R. Br.*; *Benth. in DC. Prod.* xii. 384. An erect perennial, with branched pubescent stems 2–3 ft. long. Leaves thin, ovate, crenate, glabrescent above, densely pubescent beneath, the lower shortly petioled, $1\frac{1}{2}$ –2 in. long, the upper smaller, sessile. Inflorescence racemose, long; lower whorls spaced out, subtended by produced leaves; bracts minute. Calyx $\frac{1}{8}$ – $\frac{1}{5}$ in. long; tube cylindric, strongly ribbed; mouth oblique; teeth lanceolate, much shorter than the tube. Corolla pale blue; tube shortly exserted; lips $\frac{1}{8}$ in. long.—*A. Rich. Tent. Fl. Abyss.* ii. 195; *Engl. Hochgebirgsfl. Trop. Afr.* 368; *Avetta in Ann. Istit. Bot. Roma*, vi. 60.

Nile Land. Abyssinia: Tigre; near Memsah, *Quartin-Dillon*; Samen; Ghaba, *Steudner*, 1416! near Mettaro, 8400 ft., *Schimper*, 308; near Jenausa on the northern side of Mount Aber, *Schimper*, 835! Lotho, *Schimper*, 447; Province of Wojerat, *Petit*! Shoa; Wondié dama Kasaié, *Antinori*; and without precise locality, *Salt*. British Somaliland: Serrut Mountains, near Maid, 5800 ft., *Hildebrandt*, 1427.

Also in Arabia.

3. ***N. robusta***, *Hook. f. in Journ. Linn. Soc.* vii. 212. An erect much-branched perennial 3–4 ft. high, with stems woody at the base and branches densely hairy. Leaves broadly ovate, obtuse, subsessile, crenate, rigid, densely pubescent and strongly veined beneath. Inflorescence racemose, long, moderately dense; lower whorls spaced out, subtended by ascending orbicular leaves as long as the flowers. Calyx $\frac{1}{8}$ in. long, with dense stiff hairs; tube subcylindric; teeth linear, much shorter than the tube. Corolla-tube shortly exserted, bluish-white; lips $\frac{1}{8}$ in. long.—*Engl. Hochgebirgsfl. Trop. Afr.* 368.

Upper Guinea. Old Calabar, *Thomson*! Cameroons: Cameroon Mountain, 6000–8000 ft., *Mann*, 1294! 1995! *Kalbreyer*, 114! *Johnston*, 53! 81!

4. ***N. biloba***, *Hochst.*; *Benth. in DC. Prod.* xii. 375. An erect perennial, with pubescent stems 2–3 ft. long. Leaves thin, ovate,

crenate, the lower shortly petioled, 2 in. long, the upper sessile, finely pubescent beneath. Inflorescence racemose, long; lower whorls spaced out, subtended by large leaves, their cymes shortly peduncled; bracts many, linear, densely hairy, as long as the calyx. Calyx densely villous, $\frac{1}{4}$ in. long; teeth lanceolate, shorter than the tube. Corolla-tube as long as the calyx; lower lip deflexed, $\frac{1}{6}$ in. long; upper shorter.—A. Rich. Tent. Fl. Abyss. ii. 195; Engl. Hochgebirgsfl. Trop. Afr. 368.

Nile Land. Abyssinia: Samen; on Mount Bachit, near Demerki, *Schimper*, 748! Ghaba, *Steudner*, 1419! and without precise locality, *Schimper*, 111! *Quartin-Dillon & Petit*!

5. **N. ballotæfolia**, *Hochst. ex A. Rich. Tent. Fl. Abyss. ii. 196.* An erect perennial, with short erect branched pubescent stems. Leaves thin, ovate, crenate, sessile, pubescent, 1–1 $\frac{1}{2}$ in. long. Inflorescence racemose, moderately dense; lower whorls distinct, subtended by large leaves; bracts linear, large. Calyx $\frac{1}{4}$ in. long; tube subcylindric, pubescent; teeth lanceolate, much shorter than the tube. Corolla-tube shortly exerted; lower lip $\frac{1}{8}$ in. long; upper shorter.—Engl. Hochgebirgsfl. Trop. Afr. 368.

Nile Land. Abyssinia: Samen; on mountains between Gernamora and Sabra, *Schimper*, 720; Debra Eski, 9700 ft., *Schimper*, 158; and without precise locality, *Schimper*, 5!

30. SCUTELLARIA, Linn.; Benth. et Hook. f. Gen. Plant. ii. 1201.

Calyx-tube campanulate; lips short, entire, broad, closed after flowering. Corolla-tube much exerted; limb bilabiate; upper lip short, concave; lower deflexed. Stamens 4, didynamous, arcuate; lowest longest; anthers of the upper pair 2-celled, of the lower with one cell imperfect or obsolete. Nucules subglobose or depressed, usually tubercled or hispid.—Annual or perennial herbs or undershrubs. Leaves usually toothed. Inflorescence racemose, dense or lax; whorls usually 2-flowered.

Species 90, widely spread in the North Temperate zone, some in the mountains of the Tropics.

Leaves almost sessile, lanceolate to linear.

Leaves entire 1. *S. Schweinfurthii*.

Leaves toothed 2. *S. polyadena*.

Leaves distinctly petioled, ovate.

Young stems puberulous or pubescent.

Leaves very few and small 3. *S. pauciflora*.

Leaves many, small 4. *S. De Beerstii*.

Leaves many and larger 5. *S. Livingstonei*.

Stems pilose 6. *S. peregrina*.

1. **S. Schweinfurthii**, *Briquet in Engl. Jahrb. xix. 194.* A perennial, much branched at the crown of the root, with slender erect

simple stems about 1 ft. long. Leaves lanceolate, entire, almost sessile, slightly hairy, the central ones the longest, $1\frac{1}{2}$ –2 in. long. Inflorescence racemose, long, lax; whorls 2-flowered; rhachis pubescent; bracts small; pedicels as long as the flower-calyx. Calyx pubescent, $\frac{1}{8}$ in. long in flower, $\frac{1}{4}$ in. in fruit; tube campanulate; upper lip orbicular, reflexed; lower shorter. Corolla $\frac{1}{3}$ in. long; tube widening gradually to the throat; lips $\frac{1}{6}$ in. long.

Nile Land. British East Africa: Jur; Kurshook Ali's Seriba, *Schweinfurth*, 1594! Mittu, *Schweinfurth*, 2822!

2. **S. polyadena**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 56. Stems erect, glandular-hairy, $1\frac{1}{2}$ –2 ft. long, simple or slightly branched. Leaves shortly petioled, lanceolate, acuminate, 2–4 in. long, narrowed to the base, toothed, dark green above, paler beneath, thinly clothed with spreading hairs on both surfaces. Whorls 2-flowered, placed in the axils of the upper leaves; pedicels $\frac{1}{5}$ in. long, densely glandular-pubescent. Flower-calyx $\frac{1}{6}$ in. long, glandular-pubescent; lips much shorter than the tube. Corolla violet-blue, protruded nearly an inch from the throat of the calyx; lips $\frac{1}{5}$ in. long. Stamens not exerted.—*De Wild. & Durand, Ill. Fl. Congo, t. xlvii. figs. 8–10.*

South Central. Congo Free State: Upper Marangu, near Lake Tanganyika, *De Beerst*, 96.

3. **S. paucifolia**, *Baker in Kew Bulletin*, 1895, 292. A perennial, much branched at the crown of the root, with erect pubescent stems 3–6 in. long. Leaves very few and very small, very shortly petioled, ovate, crenate, pubescent. Inflorescence racemose, 2–3 in. long; rhachis pubescent; whorls 2-flowered; bracts very small; pedicels $\frac{1}{8}$ in. long. Calyx pubescent, $\frac{1}{8}$ in. long in flower, $\frac{1}{4}$ in. in fruit; tube campanulate; upper lip orbicular, entire; lower shorter. Corolla pubescent, above $\frac{1}{2}$ in. long; tube widening gradually to the throat; lips $\frac{1}{6}$ in. long.

Mozamb. Dist. German East Africa: Lower Plateau, north of Lake Nyasa, *Thomson!* British Central Africa: Kalangwizi River at Lake Moero, *Carson*, 12 of 1894 collection! Tanganyika Plateau, *Carson!*

This, the following, and *S. Livingstonei* are very closely allied.

4. **S. De Beerstii**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 57. A tall perennial herb. Stem robust, pubescent. Leaves petioled, ovate-oblong, $\frac{1}{3}$ – $\frac{1}{2}$ in. long, obtuse, crenate, dull green, subglabrous. Whorls crowded, 2-flowered; pedicels short, pubescent; bracts small, ovate-lanceolate. Calyx $\frac{1}{6}$ in. long in flower, finally $\frac{1}{3}$ in. long, glabrescent, shining; lips small. Corolla violet-blue, protruding about $\frac{1}{2}$ in. from the throat of the calyx; lips $\frac{1}{6}$ – $\frac{1}{5}$ in. long. Stamens not exerted.—*De Wild. & Durand, Ill. Fl. Congo, t. xlvii. Figs. 1–7.*

South Central. Congo Free State: Mpala, on Lake Tanganyika, *De Beerst*, 42.

5. **S. Livingstonei**, *Baker in Kew Bulletin*, 1898, 162. A perennial, much branched at the crown of the root, with erect wiry

pubescent stems 1 ft. long. Leaves shortly petioled, ovate, crenate, densely pubescent, the longest 1 in. long. Inflorescence racemose, long, lax; rhachis densely pubescent; whorls 2-flowered; bracts all small; pedicels $\frac{1}{8}$ in. long. Calyx pubescent, $\frac{1}{8}$ in. long in flower, $\frac{1}{4}$ in. long in fruit; tube short, campanulate; upper lip orbicular, entire; lower shorter. Corolla purple, $\frac{1}{2}$ in. long; tube pubescent, widening gradually to the throat; lips $\frac{1}{8}$ in. long.

Mozamb. Dist. German East Africa: Urundi; hills near Ruvuvu River, *Scott-Elliott*, 8157! British Central Africa: Nyasaland; Manganja Hills, 3000–3500 ft., *Meller*! Blantyre, *Scott*! Mount Malosa, 4000–6000 ft., *Whyte*! Zomba, 4000–6000 ft., *Whyte*! Mount Mlanje, *Whyte*! and without precise locality, *Buchanan*, 144! Mashonaland, *Bryce*!

There was a small specimen of this in Dr. Livingstone's pocket-book, sent to Kew in 1874.

6. **S. peregrina**, *Linn.*; *Benth. in DC. Prod.* xii. 420. A perennial, with slender branched erect more or less pubescent stems. Leaves petioled, ovate, obtuse, crenate, the lower 1–1 $\frac{1}{2}$ in. long. Inflorescence racemose, long, lax; whorls 2-flowered; bracts foliaceous, petioled, oblong, entire. Calyx pubescent, $\frac{1}{8}$ in. long. Corolla violet, nearly $\frac{1}{2}$ in. long; tube gradually dilated upwards; lips $\frac{1}{8}$ in. long.—*A. Rich. Tent. Fl. Abyss.* ii. 196; *Engl. Hochgebirgsfl. Trop. Afr.* 369.

Nile Land. Eritrea: Mount Bizen, 5800 ft., *Schweinfurth & Riva*, 1879! Abyssinia: Urahut district, 9700 ft., *Schimper*, 598! 1767!

Also in the Orient and Arabia.

31. **ACHYROSPERMUM**, *Blume*; *Benth. et Hook. f. Gen. Plant.* ii. 1208.

Calyx-tube oblong, 10-nerved; teeth 5, subequal, herbaceous, not rigid. Corolla-tube funnel-shaped; limb bilabiate; upper lip short, arcuate; lower longer, deflexed, 3-lobed. Stamens 4, didynamous, arcuate, lowest pair the longest; anther-cells distinct or confluent. Disk equal. Style bifid at the apex. Nucules obovoid, scaly at the apex.—Herbs or undershrubs. Leaves large, thin, crenate. Flowers small, aggregated in dense terminal or lateral spike-like panicles; bracts ovate, membranous, persistent.

Species 8–9. Also in Tropical Asia, the Seychelles, and Madagascar.

Inflorescence produced from the side of the branches.

Leaves narrowed to the base.

Stem decumbent at the base 1. *A. radicans*.

Stem erect 2. *A. Carvalhi*.

Leaves cordate 3. *A. laterale*.

Inflorescence terminal.

Leaves oblong 4. *A. oblongifolium*.

Leaves ovate, rounded or cuneate at the base 5. *A. cryptanthum*.

Leaves cordate-ovate.

Calyx $\frac{1}{6}$ in. long 6. *A. nyasanum*.

Calyx $\frac{1}{4}$ in. long 7. *A. africanum*.

Inflorescence both terminal and lateral 8. *A. aethiopicum*.

1. **A. radicans**, *Gürke in Engl. Pfl. Ost-Afr. C.* 343. An undershrub, with a rooting base and pubescent branchlets. Leaves distinctly petioled, ovate, 4–8 in. long, acuminate, cuneate at the base, membranous, pubescent on both surfaces. Whorls congested in short dense heads arising from old leafless branches; bracts small, ovate. Calyx $\frac{1}{8}$ in. long; tube funnel-shaped; teeth small, deltoid, unequal. Corolla red, pubescent, 3–4 times the length of the calyx. Nucules furnished with narrow spathulate obtuse ciliate scales.

Mozamb. Dist. German East Africa: Usambara; Lutindi, *Holst*, 3294! Gonja, *Holst*, 4219!

2. **A. Carvalhi**, *Gürke in Engl. Pfl. Ost-Afr. C.* 343. An undershrub, with pubescent branchlets. Leaves with a long petiole, ovate, 4–8 in. long, acuminate, narrowed to the base, membranous, serrate, pilose on both surfaces. Whorls congested in short dense heads arising from old leafless branches; bracts ovate, acuminate, villous. Calyx pubescent, sub-bilabiate; teeth deltoid, acute, unequal. Corolla red, pubescent.

Mozamb. Dist. Portuguese East Africa: Gorongosa district, *Carvalho*.

3. **A. laterale**, *Baker*. An erect perennial, with long finely pubescent woody stems. Leaves all near the apex of the stem, long-petioled, cordate, acute, thin, deeply crenate, 3–4 in. long, pubescent on both sides. Panicles several, sessile on the stem below the leaves, ascending, dense, oblong-cylindric, 1–1½ in. long; pedicels very short; bracts ovate, membranous, small, green. Calyx $\frac{1}{8}$ in. long, hairy; tube oblong; teeth ovate, shorter than the tube. Corolla reddish.

Mozamb. Dist. British Central Africa: Nyasaland; on the top of Wiraudi, near Blantyre, *Buchanan*, 98!

The Javan *A. densiflorum*, Blume, is given by Dr. Henriques (*Bolet. Soc. Brot.* x. 150) as occurring in the Island of St. Thomas, where it has been collected by Quintas.

4. **A. oblongifolium**, *Baker*. A perennial, with short slender densely hairy erect stems. Leaves shortly petioled, oblong with a cuneate base, acute, membranous, obscurely crenate, 3–5 in. long, 1½–2 in. broad, finely pubescent on both sides. Panicles terminal only, dense, oblong, 1 in. long; pedicels very short; bracts shorter than the calyx. Calyx pubescent, $\frac{1}{4}$ in. long; teeth ovate, acute, subequal, shorter than the oblong tube. Corolla not seen.

Upper Guinea. Fernando Po, *Barter*, 1697!

5. **A. cryptanthum**, *Baker in Kew Bulletin*, 1898, 162. An undershrub. Branchlets woody, terete, densely pubescent. Leaves shortly petioled, ovate, 3–4 in. long, acute, rounded or cuneate at the base, crenate, green and thinly pilose on both surfaces. Cymes sessile, umbellate, forming a dense cylindric terminal panicle 5–6 in. long; bracts foliaceous, broadly ovate, the lower $\frac{1}{3}$ – $\frac{1}{2}$ in. broad; pedicels

pubescent, shorter than the calyx. Calyx pubescent, finally $\frac{1}{3}$ in. long; tube funnel-shaped; teeth ovate, subequal, $\frac{1}{12}$ in. long. Corolla $\frac{1}{2}$ in. long; upper lip oblong, lower orbicular. Stamens just exerted.

Mozamb. Dist. British Central Africa: Nyasaland; Masuka Plateau, 6500–7000 ft., *Whyte!*

6. **A. nyasanum**, *Baker*. A perennial, with densely hairy stems. Leaves petioled, cordate-ovate, crenate, densely hairy on both sides. Racemes terminal only, dense, oblong-cylindrical, 2–3 in. long; pedicels very short; bracts ovate-cuspidate, $\frac{1}{6}$ in. long. Calyx slightly hairy, $\frac{1}{6}$ in. long; teeth ovate or oblong, rather shorter than the oblong tube. Corolla-tube shortly exerted; lips $\frac{1}{6}$ in. long.

Mozamb. Dist. Portuguese East Africa: Mountains east of Lake Nyasa, *Johnson!*

7. **A. africanum**, *Hook. f.* A perennial, with densely hairy erect woody stems 3–6 ft. long. Leaves long-petioled, cordate-ovate, acute, membranous, crenate, 4–5 in. long, slightly hairy, narrowed suddenly at the base to the winged petiole. Racemes terminal only, dense, oblong-cylindrical, 4–5 in. long; pedicels very short; bracts ovate, green, as long as the calyx. Calyx $\frac{1}{4}$ in. long, slightly hairy; teeth ovate, acute, shorter than the tube. Corolla purple.

Upper Guinea. Cameroons: Cameroon Mountain, 2000–3000 ft., *Mann*, 1297! 1949! Victoria, 3000 ft., *Kalbreyer*, 99!

8. **A. æthiopicum**, *Welw. in Trans. Linn. Soc. xxvii. 56.* A perennial, with erect woody pubescent stems 4–6 ft. long. Leaves long-petioled, ovate, acute, membranous, deeply crenate, slightly hairy, 4–5 in. long, narrowed suddenly to the winged petiole. Racemes both terminal and axillary, dense, oblong-cylindrical, 3–4 in. long; pedicels very short; bracts ovate-cuspidate, pale green, pubescent, lower $\frac{1}{4}$ in. long. Flower-calyx hairy, $\frac{1}{6}$ in. long; teeth ovate, shorter than the tube. Corolla whitish; tube not exerted; lips small.—*Hiern in Cat. Afr. Pl. Welw. i. 874.*

Lower Guinea. Angola: Pungo Andongo; in damp shady woods, especially about the Calundo Waterfall, 3200 ft., *Welwitsch*, 1633!

32. **STACHYS**, Linn.; Benth. et Hook. f. Gen. Plant. ii. 1208.

Calyx-tube funnel-shaped, 5–10-ribbed; teeth 5, subequal. Corolla-tube included or exerted; limb bilabiate; upper lip ascending, oblong, concave; lower deflexed, 3-lobed. Stamens 4, didynamous, arcuate; lowest pair the longest; anther-cells 2, parallel or divaricate. Disk usually equal. Style bifid at the apex. Nucules ovoid or oblong,

obtuse.—Annual or perennial herbs or low shrubs. Leaves sessile or petioled, entire or toothed. Whorls axillary or crowded into terminal racemose panicles. Flowers small or medium-sized, various in colour.

Species about 200, cosmopolitan, concentrated in the Temperate regions of both hemispheres.

*EU-STACHYS.—Herbaceous.

Stems trailing, prickly	1. <i>S. aculeolata</i> .
Stems erect, not prickly.	
Leaves lanceolate	2. <i>S. pseudonigricans</i> .
Leaves oblong-lanceolate	3. <i>S. huillensis</i> .
Leaves oblong	4. <i>S. nemorivaga</i> .
Leaves ovate-oblong	5. <i>S. andongensis</i> .
Leaves ovate	6. <i>S. æthiopica</i> .

**AMBLEIA.—Shrubby.

Calyx-teeth deltoid.	
Leaves entire	7. <i>S. palæstina</i> .
Leaves crenate	8. <i>S. Hildebrandtii</i> .
Calyx-teeth lanceolate	9. <i>S. bizensis</i> .

1. ***S. aculeolata***, *Hook. f. in Journ. Linn. Soc.* vi. 18, and vii 213. A perennial, with very slender trailing stems, muricated with reflexed prickles. Leaves distant, distinctly petioled, cordate-ovate, conspicuously crenate, pubescent on both sides, the largest 1 in. long. Whorls few, distant, the lower subtended by reduced leaves. Calyx $\frac{1}{6}$ in. long; teeth ovate-cuspidate, shorter than the tube. Corolla pinkish-white, $\frac{1}{2}$ in. long; lower lip as long as the tube; upper shorter.—*Engl. Hochgebirgsfl. Trop. Afr.* 369.

Upper Guinea. Cameroons: Cameroon Mountain, 8000 ft., *Johnston*, 71!
Fernando Po: Clarence Peak, 9000 ft., *Mann*, 319!

Nile Land. Abyssinia: Shoa: Ankober, *Roth*, 520!

2. ***S. pseudonigricans***, *Gürke in Engl. Jahrb.* xxviii. 315. A perennial herb, with erect pubescent branched stems about 3 ft. long. Leaves distant, sessile, thin, lanceolate, obscurely crenate, slightly hairy on both sides, narrowed to the base, the largest 2–3 in. long. Whorls many, distant, 6-flowered, the lower subtended by large leaves; pedicels short, pubescent. Calyx pubescent, $\frac{1}{6}$ in. long; teeth deltoid, subequal, not mucronate, shorter than the tube. Corolla-tube as long as the calyx; lower lip $\frac{1}{6}$ in. long.

Mozamb. Dist. British Central Africa: Nyasaland; Shire Highlands, *Buchanan*, 28! and without precise locality, *Buchanan*, 1!

3. ***S. huillensis***, *Hiern in Cat. Afr. Pl. Welw.* i. 875. A perennial herb, with numerous erect sparingly branched hoary stems 1–2 ft. long, from a woody rootstock. Leaves subsessile, oblong-lanceolate, 2–3 in. long, membranous, acute, crenate, cuneate or slightly rounded at the base, dark green and slightly hairy above, paler and more hairy beneath. Whorls 4–5, only the lowest subtended by short leaves;

pedicels very short. Calyx $\frac{1}{4}$ in. long, densely hairy; teeth lanceolate, half as long as the tube. Corolla white, $\frac{3}{8}$ in. long; tube cylindrical, twice as long as the lips; upper lip round, shorter than the lower. Stamens not exerted.

Lower Guinea. Angola: Huilla, in dry bushy pastures between Lopollo and Catemba, *Welwitsch*, 5509! in swampy woods between Ohai and Catemba, *Welwitsch*, 5510!

4. **S. nemorivaga**, *Briquet in Engl. Jahrb.* xix. 192. A tall branched herb, with long internodes and branches clothed with spreading hairs. Leaves shortly petioled, oblong, $1\frac{1}{2}$ –3 in. long, obtuse, rounded or truncate at the base, inciso-crenate, green and pilose on both surfaces. Whorls 6-flowered; pedicels short. Calyx in flower $\frac{1}{4}$ in., finally $\frac{1}{2}$ in. long; tube long, pilose; teeth lanceolate-deltoid, $\frac{1}{3}$ the length of the tube. Corolla $\frac{1}{2}$ in. longer than the calyx; tube exerted; lower lip longer than the upper, slightly 3-lobed. Stamens not exerted.

Lower Guinea. Angola: Malange, *Mechow*, 287.

Allied to *S. æthiopica*, Linn.

5. **S. andongensis**, *Hiern in Cat. Afr. Pl. Welw.* i. 874. A perennial herb, with branched pubescent stems 4 ft. long. Leaves shortly petioled, ovate-oblong, 2– $4\frac{1}{2}$ in. long, acuminate, minutely toothed, broadly rounded at the base, membranous, dark green and nearly glabrous above, pale and pubescent beneath. Whorls about 4, many-flowered, only the lowest subtended by large leaves; pedicels very short. Calyx pubescent, nearly $\frac{1}{3}$ in. long; tube oblong; teeth lanceolate, half as long as the tube. Corolla red-violet, $\frac{3}{8}$ in. long; tube cylindrical, twice as long as the lips; upper lip rounded, much shorter than the lower. Stamens not exerted.

Lower Guinea. Angola: Pungo Andongo; damp thickets about the gigantic rocks of Catete, *Welwitsch*, 5546!

6. **S. æthiopica**, *Linn.*; *Benth. in DC. Prod.* xii. 476. A herbaceous perennial, with slender erect branched densely hairy unarmed stems. Leaves distinctly petioled, ovate, crenate, 1– $1\frac{1}{2}$ in. long, hairy on both surfaces. Whorls many, forming a lax terminal racemose panicle; bracts only the lowest longer than the calyx; pedicels very short. Calyx hairy, $\frac{1}{4}$ in. long; teeth equal, lanceolate, as long as the tube. Corolla-tube as long as the calyx; lower lip nearly as long as the tube.—*Britten in Trans. Linn. Soc. ser. 2, Bot. iv.* 37.

Mozamb. Dist. British Central Africa: Nyasaland; Mount Mlanje, *Whyte*!

Also in South Africa.

7. **S. palæstina**, *Linn.*; *Benth in DC. Prod.* xii. 491, var. **hypoleuca**, *Baker*. A much-branched undershrub, with slender branchlets,

coated with white tomentum. Leaves sessile, lanceolate, entire, $1\frac{1}{4}$ –2 in. long, rounded at the base, green and thinly tomentose above, densely white-tomentose below. Whorls crowded into a terminal spicate panicle, the lower subtended by large leaves. Calyx $\frac{1}{4}$ in. long, white tomentose; teeth deltoid, much shorter than the tube. Corolla-tube as long as the calyx; lower lip as long as the tube.—*S. hypoleuca*, Hochst. ex Schimp. Pl. Abyss. Exsicc. ii. No. 855; A. Rich. Tent. Fl. Abyss. ii. 197; Engl. Hochgebirgsfl. Trop. Afr. 369.

Nile Land. Abyssinia: Mount Aber, near Jenausa, *Schimper*, 855!

Var. *Schimperi*, Baker. Leaves shorter, linear-oblong. Whorls of flowers more numerous and laxer.—*S. Schimperi*, Vatke in *Linnaea*, xxxvii. 330; Engl. l.c.

Nile Land. Abyssinia: Urahut District, *Schimper*, 592!

The type is also Oriental.

8. **S. Hildebrandtii**, *Vatke in Linnaea*, xliii. 95. An undershrub 6 ft. high., with slender woody branchlets, densely clothed with white tomentum. Leaves shortly petioled, oblong, crenate, 1–2 in. long, firm, dull green and thinly pubescent above, densely coated with whitish tomentum beneath. Whorls few, crowded into a short terminal spicate panicle; lower bracts longer than the flowers. Calyx densely pubescent, $\frac{1}{4}$ in. long; teeth deltoid, acute, much shorter than the tube. Corolla-tube not exerted; lower lip shorter than the tube.—Engl. Hochgebirgsfl. Trop. Afr. 369.

Nile Land. British Somaliland: Serrut Mountains, near Maid, 5800 ft., *Hildebrandt*, 1426!

Nearly allied to *S. palæstina*, Linn.

9. **S. bizensis**, *Schweinf. Pl. Abyss. Sept. Exsicc. No. 1827*. A shrub, with slender branchlets clothed with white tomentum. Leaves sessile, lanceolate, 1– $1\frac{1}{2}$ in. long, entire or obscurely crenate, acute or obtuse, thick, grey and thinly tomentose above, densely coated with white tomentum beneath, the main veins raised. Whorls few-flowered, axillary; pedicels $\frac{1}{12}$ – $\frac{1}{8}$ in. long. Calyx $\frac{1}{3}$ in. long, densely clothed with white tomentum; tube subcylindrical, strongly ribbed; teeth equal, lanceolate, acuminate, half as long as the tube. Corolla pallid, not much longer than the calyx. Stamens included.

Nile Land. Eritrea: summit of Mount Bizen, 8000 ft., *Schweinfurth*, 1847!

33. LAMIUM, Linn.; Benth. et Hook. f. Gen. Plant. ii. 1210.

Calyx-tube straight, 5-nerved; teeth 5, mucronate, subequal. Corolla-tube usually exerted; limb bilabiate; upper lip ascending, concave; lower deflexed, 3-lobed. Stamens 4, didynamous, arcuate; anther-cells divergent. Disk equal. Style bifid at the apex. Nucules triquetrous, with a truncate apex.—Annual or perennial herbs. Leaves

usually cordate, crenate or inciso-crenate. Whorls axillary or capitate.

Species 40, concentrated in the North Temperate zone of the Old World.

1. **L. amplexicaule**, *Linn.*; *Benth. in DC. Prod.* xii. 508. An annual, much branched at the crown of the root, with erect stems about $\frac{1}{2}$ ft. long. Leaves in distant pairs; lower long petioled, cordate-ovate, small, deeply crenate; floral leaves sessile, amplexicaul. Flowers confined to the axils of the upper sessile leaves, sometimes small and cleistogamous. Calyx densely hairy, nearly $\frac{1}{4}$ in. long; teeth lanceolate-subulate, rather longer than the tube. Corolla red, $\frac{1}{2}$ in. long; tube slender, much longer than the calyx.—*Engl. Hochgebirgsfl. Trop. Afr.* 369.

Nile Land. Abyssinia: Begemeder; near Gafat, in cultivated fields, 8000–9000 ft., *Schimper*, 1153, and without precise locality, *Schimper*, 292! *Roth!*

Also in Europe, West Asia, North Africa, and Canary Islands.

34. **LASIOCORYS**, *Benth.*; *Benth. et Hook. f. Gen. Plant.* ii. 1213.

Calyx-tube funnel-shaped, 10-nerved; teeth 5, equal, or the lower longer. Corolla-tube not longer than the calyx, furnished with a ring of hairs inside; limb bilabiate; upper lip entire, deeply concave; lower 3-lobed. Stamens 4, didynamous, arcuate; anthers with 2 divaricate cells. Disk produced on the lower side. Style bifid; upper fork shorter or abortive. Nucules ovoid-triangular, obtuse.—Undershrubs or herbs. Leaves sessile or petioled, varying from ovate to linear, crenate or entire. Whorls axillary, many-flowered; bracts small or large. Habit of *Leucas*, from which it differs by its 5-toothed calyx.

Species 9, the others in Arabia, Socotra, and South Africa. Briquet, Gürke, and Hiern place *Lasiocorys* as a section of *Leucas*, from which it differs by the teeth of the calyx being not more than five.

Calyx-teeth subulate from a broad base	1. <i>L. Eenii</i> .
Calyx-teeth lanceolate	2. <i>L. poggeana</i> .
Calyx-teeth deltoid.	
Throat of calyx-tube not oblique.	
Leaves oblanceolate	3. <i>L. abyssinica</i> .
Leaves ovate	4. <i>L. stachydiformis</i> .
Throat of calyx-tube oblique.	
Leaves oblanceolate	5. <i>L. argyrophylla</i> .
Leaves ovate	6. <i>L. arabica</i> .

1. **L. Eenii**, *Baker*. Annual. Stems erect, pubescent, 2–3 ft. long, slightly branched. Leaves sessile, lanceolate or narrowly elliptic, obtuse, cuneate at the base, crenate, pubescent. Flowers in globose axillary or terminal whorls, subsessile; bracts subulate, strongly ciliate, $\frac{1}{8}$ – $\frac{1}{4}$ in. long. Calyx $\frac{1}{5}$ in. long, pubescent; tube oblong-campanulate;

teeth subulate from a broad base. Corolla white, $\frac{1}{4}$ in. long; tube twice as long as the lips.—*Leucas Eeni*, Hiern in Cat. Afr. Pl. Welw. i. 878.

Lower Guinea. Angola; Mossamedes, in gravelly thickets on the banks of the river Bero, *Welwitsch*, 5846. Damaraland, *Een*.

2. **L. poggeana**, *Briquet in Engl. Jahrb.* xix. 193. Stem branched, pubescent only on the angles. Leaves shortly petioled, lanceolate, $1\frac{1}{2}$ –2 in. long, acute, narrowed to the base, serrate, green and glabrescent on both surfaces. Whorls axillary, formed of two shortly peduncled globose cymes. Calyx subsessile, nearly $\frac{1}{2}$ in. long when mature; tube long, glabrescent and strongly ribbed towards the base, inflated and villous above the middle; teeth 5, subequal, lanceolate-cuspidate, very small. Corolla and stamens unknown.

South Central. Congo Free State: Lunda; Lulua River, *Pogge*, 1122.

3. **L. abyssinica**, *Benth. in DC. Prod.* xii. 534. An undershrub, with slender pale woody branches, clothed with short pubescence. Leaves very numerous, sessile or shortly petioled, oblanceolate or rarely obovate, entire or obscurely toothed in the upper half, firm, subglabrous. Whorls very numerous, few-flowered; bracts minute. Calyx glabrous, $\frac{1}{4}$ in. long; throat equal; teeth large, deltoid-cuspidate. Corolla half as long again as the calyx; upper lip $\frac{1}{6}$ in. long, finely hairy.—A. Rich. Tent. Fl. Abyss. ii. 201; Vatke in Linnæa. xliii. 98; Schweinf. Beitr. Fl. Aethiop. 122; Engl. Hochgebirgsfl. Trop. Afr. 371. *Leucas quinque-dentata*, R. Br. in Salt, Abyss. Append. 64 (name only). *L. abyssinica*, *Briquet ex Gürke in Engl. Jahrb.* xxii. 136.

Nile Land. Eritrea: near the coast in the Shohos district, *Ehrenberg*; Habab; Nakfa, 6000 ft., *Hildebrandt*, 432; Bogos; Keren, *Steudner*, 1399! Abyssinia: Province of Wojerat, *Petit!* and without precise locality, *Schimper*, 502! 1851! British Somaliland: Serrut Mountains, near Maid, 5800 ft., *Hildebrandt*, 1422A.

4. **L. stachydiformis**, *Benth. in DC. Prod.* xii. 534. A branched undershrub, with branchlets densely clothed with short whitish spreading hairs. Leaves sessile or subsessile, ovate, crenate, the lower $1\frac{1}{2}$ –2 in. long, pale and densely pubescent beneath, greenish and less pubescent above. Whorls distant, many-flowered; bracts large, linear, densely hairy. Calyx-tube strongly ribbed, densely hairy, $\frac{1}{4}$ in. long; throat equal; teeth deltoid, with very large spinous points. Upper corolla-lip $\frac{1}{6}$ in. long, all densely clothed with white hairs.—A. Rich. Tent. Fl. Abyss. ii. 202; Schweinf. Beitr. Fl. Aethiop. 123; Engl. Hochgebirgsfl. Trop. Afr. 370; Avetta in Ann. Istit. Bot. Roma, vi. 60. *Leucas stachydiformis*, *Briquet ex Gürke in Engl. Jahrb.* xxii. 136. *Ballota stachydiformis*, *Hochst. ex A. Rich. Tent. Fl. Abyss.* ii. 202.

Nile Land. Abyssinia: Gajeh-Merki, 8400 ft., *Schimper*, 583; Lotho, *Schimper*, 448; Debra Eski, *Schimper*, 146; Ataba, *Steudner*, 1411; on mountains near Jenansa, *Schimper*, 852! Province of Wojerat, *Petit!* Shoa; Cora, *Ragazzi*; and without precise locality, *Schimper*, 936!

5. **L. argyrophylla**, *Vatke in Oester. Bot. Zeitschr.* 1875, 96. An undershrub, with simple branchlets $1\frac{1}{2}$ –2 ft. long. Leaves subsessile, oblanceolate, subobtuse, entire or obscurely toothed towards the obtuse apex, $1\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad, silky on both sides. Whorls many, 2–10-flowered; bracts small. Calyx funnel-shaped, $\frac{1}{4}$ in. long; throat oblique, produced on the lower side; teeth deltoid-cuspidate. Corolla as in *L. abyssinica*.—*Engl. Hochgebirgsfl. Trop. Afr.* 371. *Leucas argyrophylla*, Briquet ex Gürke in *Engl. Jahrb.* xxii. 135. *L. hyssopifolia*, Franch. Sert. Somal. 57. *L. franchetiana*, Gürke in *Engl. Jahrb.* xxii. 135.

Nile Land. Somaliland: Ahl Mountains, at Yafir, 6000 ft., *Hildebrandt*, 852; Boobi, *James & Thrupp!* and without precise locality, *Révoil*.

6. **L. arabica**, *Jaub. et Spach, Illust. Pl. Orient.* iv. 126, t. 383. A tall branched perennial herb, with slender obscurely hairy stems. Leaves shortly petioled, ovate, acute, deeply crenate, finely pubescent, 1–2 in. long. Whorls many-flowered, in the axils of large leaves all down the stem; bracts large, subulate. Calyx finely hairy, $\frac{1}{4}$ – $\frac{1}{3}$ in. long; tube funnel-shaped; throat oblique; teeth deltoid-cuspidate, $\frac{1}{3}$ the length of the tube. Corolla-tube as long as the calyx; upper lip lingulate, as long as the tube, finely hairy outside. Stamens shorter than the lips.—*L. royleoides*, *Vatke in Linnæa*, xliii. 98. *Ballota royleoides*, Benth. in *DC. Prod.* xii. 520. *Leucas royleoides*, Gürke in *Engl. Jahrb.* xxii. 136.

Nile Land. British Somaliland: Ahl Mountains, 3400 ft., *Hildebrandt*, 1422. Also in Arabia.

35. ACROTOME, Benth.; Benth. et Hook. f. *Gen. Plant.* ii. 1206.

Calyx accrescent, between tubular and campanulate, 10-ribbed; throat oblique; teeth 5–10. Corolla-tube as long as or longer than the lip; limb bilabiate; upper lip small, concave, lower 3-lobed. Stamens 4, didynamous, included in the corolla-tube; lower pair longest; anthers confluent, 1-celled. Disk equal. Style bearded below the apex, entire or emarginate. Nucules acutely triquetrous, truncate at the apex.—Perennial herbs or undershrubs. Leaves entire or serrate, those subtending the whorls like the others. Flowers small, whitish.

Species 4, the others in South Africa.

1. **A. Belckii**, *Gürke in Bull. Herb. Boiss.* vi. 549. Stem erect, branched, pubescent. Leaves linear-lanceolate, 4 in. long, subacute, narrowed to a short petiole, deeply serrate, pubescent on both surfaces. Whorls few-flowered; bracts subulate, $\frac{1}{6}$ in. long. Calyx pubescent, finally $\frac{1}{4}$ in. long; teeth 8, deltoid, acuminate.

Lower Guinea. German South-west Africa: Hereroland; Otyitambi, *Belck*, 40.

36. **BALLOTA**, Linn.; Benth. et Hook. f. Gen. Plant. ii.
1212.

Calyx-tube funnel-shaped, 10-ribbed; limb usually with 5–10 teeth rarely more, or entire. Corolla-tube with a ring of hairs inside; limb bilabiate; upper lip ascending, oblong, concave; lower 3-lobed. Stamens 4, didynamous, arcuate; lower pair the longest; anther-cells 2, divaricate. Disk entire or lobed. Style bifid at the apex. Nucules ovoid-oblong, smooth.—Perennial herbs or undershrubs. Leaves petioled, ovate, crenate. Whorls of flowers produced from the axils of developed leaves; bracteoles foliaceous or subulate.

Species 25, concentrated in the Mediterranean and Oriental regions, one South African.

Whorls 2-flowered	.	.	.	.	.	.	1. <i>B. fruticosa</i> .
Whorls 5–6-flowered	.	.	.	.	.	.	2. <i>B. Hildebrandtii</i> .

1. **B. fruticosa**, *Baker in Kew Bulletin*, 1895, 225. A much-branched undershrub. Stems densely clothed with fine short white pubescence. Leaves petioled, orbicular, very small, crenate, subcoriaceous, green and obscurely pubescent above, densely pubescent with raised veins beneath. Flowers solitary, sessile, axillary. Calyx finally $\frac{1}{2}$ in. long; tube funnel-shaped, 10-ribbed; limb accrescent, oblique, shortly toothed, finally spreading, $\frac{1}{3}$ in. diam. Corolla and stamens not seen.

Nile Land. British Somaliland: without precise locality, *Miss Edith Cole!*

2. **B. Hildebrandtii**, *Vatke et Kurtz in Oester. Bot. Zeitschr.* 1875, 95. An undershrub, 5–6 ft. high, with slender woody densely hairy branchlets. Leaves distinctly petioled, small, ovate, deeply crenate, densely hairy on both sides. Whorls 5–6-flowered, sessile in the axils of the fully-developed upper leaves; bracteoles firm, subulate, shorter than the calyx. Calyx-tube $\frac{1}{4}$ in. long, funnel-shaped, densely pubescent, with 10 strongly-raised ribs; limb short, spreading, membranous, with 10 obscure teeth. Upper lip of the corolla oblong, emarginate, densely villous.—*Vatke in Linnæa*, xliii. 96; *Engl. Hochgebirgsfl. Trop. Afr.* 369.

Nile Land. British Somaliland: Serrut Mountains, near Maid, 5200 ft., *Hildebrandt*, 1425! Ahl Mountains, at Yafir, 6500 ft., *Hildebrandt*, 849.

37. **LEUCAS**, R. Br.; Benth. et Hook. f. Gen. Plant. ii.
1213.

Calyx narrowly funnel-shaped or oblong, equal or oblique at the throat; ribs and teeth 8–10. Corolla-tube as long as the calyx, naked or furnished with a ring of hairs inside; upper lip arcuate, convex; lower about as long, 3-lobed. Stamens 4, didynamous; anther-cells divaricate, finally confluent. Disk equal or obliquely produced. Style

with a very short upper lobe. Nucules ovoid-triquetrous.—Annual or perennial herbs or undershrubs. Leaves entire or toothed; upper floral leaves like the others or reduced. Whorls few or many-flowered, usually remote. Corolla pallid; upper lip densely clothed with white hairs.

Species about 100, spread through the tropical regions of the Old World, one also American.

*ASTRODON, Benth. Calyx-tube not oblique at the throat.

Bracts large.

Leaves sessile or subsessile.

Leaves linear 1. *L. cephalantha*.

Leaves lanceolate 2. *L. Stormsii*.

Leaves ovate.

Whorls 1–3 3. *L. menthæfolia*.

Whorls many.

Calyx $\frac{1}{3}$ in. long 4. *L. myriantha*.

Calyx $\frac{1}{6}$ in. long 5. *L. masukuensis*.

Leaves obovate-cuneate 6. *L. cuneifolia*.

Leaves petioled.

Leaves ovate-lanceolate 7. *L. usagarensis*.

Leaves ovate.

Whorls distant 8. *L. nubica*.

Whorls crowded into a terminal head 9. *L. microscypha*.

Leaves obovate-cuneate.

Perennial.

Whorl 1, terminal 10. *L. masaiensis*.

Whorls few, axillary 11. *L. venulosa*.

Annual 12. *L. Elliotii*.

Bracts small.

Calyx-tube campanulate.

Whorls 3–4-flowered 13. *L. Pechuelii*.

Whorls many-flowered.

Leaves oblong 14. *L. altissima*.

Leaves suborbicular 15. *L. inflata*.

Calyx-tube funnel-shaped.

Leaves lanceolate, shortly petioled 16. *L. Jamesii*.

Leaves lanceolate or oblong-lanceolate, sessile 17. *L. milanjana*.

Leaves suborbicular 18. *L. Welwitschii*.

Imperfectly known species 19. *L. tomentosa*.

**PLAGIOSTOMA, Benth. Throat of calyx-tube oblique, produced on the upper side.

The only species 20. *L. martinicensis*.

***LOXOSTOMA, Benth. Throat of calyx-tube oblique, produced on the lower side.

†Bracts obsolete.

Annual 21. *L. ebracteata*.

Perennial 22. *L. Holstii*.

††Bracts minute.

§Leaves sessile or subsessile.

Leaves oblong-lanceolate 23. *L. neuflyzeana*.

Leaves oblong 24. *L. Schweinfurthii*.

Leaves ovate.

Calyx $\frac{1}{6}$ in. long 25. *L. concinna*.

- Calyx $\frac{1}{3}$ in. long 26. *L. microphylla*.
 Leaves orbicular 27. *L. orbicularis*.
 §§ Leaves petioled.
 Leaves oblong-lanceolate 28. *L. decurvata*.
 Leaves ovate-oblong.
 Hairs of stem and leaves few, rigid 29. *L. Junodii*.
 Hairs of stem and leaves many, soft 30. *L. lanata*.
 Leaves ovate.
 Whorls few-flowered.
 Leaves nearly glabrous 31. *L. glabrata*.
 Leaves more or less hairy.
 Leaves very small.
 Teeth of lower calyx-lip lanceolate 32. *L. thymoides*.
 Teeth of lower calyx-lip deltoid 33. *L. pratensis*.
 Leaves about 1 in. long 34. *L. paucijuga*.
 Leaves $1\frac{1}{2}$ –2 in. long 35. *L. shirensis*.
 Whorls many-flowered.
 Whorls 2 36. *L. nepetoides*.
 Whorls many.
 Upper whorls close 37. *L. densiflora*.
 Whorls all distant.
 Leaves small 38. *L. trachyphylla*.
 Leaves large 39. *L. lamioides*.
 ††† Bracts large.
 § Leaves sessile or subsessile.
 Leaves linear or lanceolate.
 Whorls few-flowered 40. *L. Fleckii*.
 Whorls many-flowered.
 Calyx about $\frac{1}{3}$ in. long.
 Leaves small 41. *L. Bakeri*.
 Leaves large 42. *L. stricta*.
 Calyx $\frac{2}{3}$ in. long 43. *L. villosa*.
 Calyx nearly 1 in. long 44. *L. stenophylla*.
 Leaves linear-oblong 45. *L. Nyassæ*.
 Leaves oblong-lanceolate.
 Fruit-calyx $\frac{1}{2}$ in. long 46. *L. Descampsii*.
 Fruit-calyx 1 in. long 47. *L. tettensis*.
 Leaves oblong.
 Whorls of flowers 1–2 48. *L. oligocephala*.
 Whorls of flowers many, crowded 49. *L. calostachys*.
 Leaves ovate.
 Whorls of flowers distant 50. *L. leucotricha*.
 Whorls of flowers approximate 51. *L. grandis*.
 Leaves obovate-cuneate 52. *L. fasciculata*.
 §§ Leaves petioled.
 Leaves lanceolate.
 Whorls of flowers solitary, terminal 53. *L. Carsonii*.
 Whorls of flowers more than one.
 Bracts linear-subulate 54. *L. micrantha*.
 Bracts lanceolate 55. *L. bracteosa*.
 Leaves oblong-lanceolate.
 Leaves slightly hairy 56. *L. deflexa*.
 Leaves with numerous adpressed hairs.
 Leaves acute 57. *L. Volkensii*.

Leaves obtuse	58. <i>L. velutina.</i>
Leaves with numerous spreading hairs	59. <i>L. megasphæra.</i>
Leaves ovate.	
Leaves very small	60. <i>L. Colea.</i>
Leaves not very small.	
Stem finely hairy.	
Whorls 1-2	61. <i>L. kondowensis.</i>
Whorls many.	
Annual	62. <i>L. urticifolia.</i>
Perennial	63. <i>L. Whytei.</i>
Stem densely villous.	
Teeth of lower calyx-lip not cuspidate	64. <i>L. mollis.</i>
Teeth of lower calyx-lip cuspidate	65. <i>L. bukobensis.</i>
Leaves suborbicular	66. <i>L. somaliensis.</i>

1. **L. cephalantha**, *Baker*. A perennial herb, with a very slender finely hairy stem 1 ft. long. Leaves firm, sessile, hairy, entire, linear with revolute edges, 1-1½ in. long. Whorl solitary, terminal, many-flowered; bracts large, linear, rigidly ciliate. Calyx hairy, ¼ in. long; throat not oblique; teeth small, deltoid. Upper corolla-lip ⅙ in. long, densely villous.

Mozamb. Dist. German East Africa: Lower Plateau north of Lake Nyasa, Thomson!

2. **L. Stormsii**, *Gürke in Engl. Jahrb.* xxii. 140. Stem simple or slightly branched, pubescent. Leaves sessile, lanceolate, 1½-2 in. long, ¼-⅜ in. broad, acute or acuminate, serrate upwards, membranous, pubescent on both surfaces. Whorls many-flowered; bracts lanceolate, pubescent, as long as or shorter than the calyx. Fruit-calyx pubescent, ½ in. long; throat not oblique; teeth 10, lanceolate-subulate.

Mozamb. Dist. German East Africa: Karema on Lake Tanganyika, Storms, 4.

3. **L. menthæfolia**, *Baker*. A perennial herb, with densely pilose spreading stems. Leaves nearly sessile, ovate, the largest 1 in. long, obtuse, crenate, thick, thinly pilose on the upper surface, densely pilose and with the main veins raised beneath. Whorls 1-3, distant, many-flowered; bracts large, linear, densely ciliate. Calyx pubescent, ¼ in. long; throat not oblique; teeth minute. Upper lip of corolla ¼ in. long, densely villous. Stamens included.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, south of Lake Tanganyika, 5250 ft., Nutt!

4. **L. myriantha**, *Baker in Kew Bulletin*, 1898, 163. A perennial herb. Stems erect, pubescent, simple or forked. Leaves nearly sessile, ovate, 1-1½ in. long, entire, broadly rounded at the base, green and thinly pilose on both surfaces, densely dotted with black glands beneath. Whorls very numerous, many-flowered, contiguous, forming a long cylindrical panicle; lower primary bracts large, upper

small; flower-bracts lanceolate, as long as the calyx. Calyx densely pubescent, $\frac{1}{3}$ in. long; tube short; throat equal; teeth equal, setaceous. Corolla-tube as long as the calyx; upper lip small, oblong. Stamens not exerted.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte*, 178! 214! and between Mpata and the commencement of the Tanganyika plateau, *Whyte*!

5. **L. masukuensis**, *Baker in Kew Bulletin*, 1898, 162. An erect perennial herb. Stem slender, branched, densely pubescent. Leaves nearly sessile, very small, broadly ovate, acute, broadly rounded at the base, subentire, green and slightly pilose on both surfaces, closely dotted with black glands beneath. Whorls close, many-flowered, forming a long cylindrical panicle; primary bracts small, ovate; pedicels very short; flower bracts lanceolate, as long as the calyx. Calyx pubescent, $\frac{1}{6}$ in. long; tube subcylindrical, equal at the throat; teeth subequal, lanceolate-setaceous. Corolla-tube as long as the calyx; lips small. Stamens not exerted.

Mozamb. Dist. British Central Africa: Nyasaland; Masuka Plateau, 6500–7000 ft., *Whyte*!

6. **L. cuneifolia**, *Baker*. A perennial herb, with short hairy stems. Leaves subsessile, obovate-cuneate, firm, densely hairy, under 1 in. long, crenate in the upper half, entire in the lower half. Whorls many, few-flowered; bracts large, linear. Calyx densely hairy, $\frac{1}{4}$ in. long; throat not oblique; teeth minute, deltoid. Upper corolla-lip as long as the calyx.

Nile Land. Somaliland: Zafarag, *James & Thrupp*!

7. **L. usagarensis**, *Gürke in Engl. Jahrb.* xxii. 138. Stem $1\frac{1}{2}$ –2 ft. long, slightly branched, pubescent. Leaves distinctly petioled, ovate-lanceolate, $1\frac{1}{2}$ –2 in. long, about 1 in. broad, acuminate, narrowed to the base, sharply serrate, sparsely villous on both surfaces. Whorls many-flowered; bracts linear-subulate, hispid, as long as the calyx. Fruit-calyx $\frac{2}{3}$ in. long, hispid; throat slightly oblique; teeth lanceolate-deltoid, mucronate. Corolla violet, under $\frac{2}{3}$ in. long.

Mozamb. Dist. German East Africa: Usagara; Kidete, *Stuhlmann*, 183.

8. **L. nubica**, *Benth. in DC. Prod.* xiii. 530. A much-branched erect annual, with pale finely pubescent stems. Leaves thin, petioled, ovate, acute, crenate, slightly hairy, the lower $1\frac{1}{2}$ –2 in. long. Whorls many, distant, many-flowered; bracts large, linear, strongly ciliate. Calyx-tube hairy, $\frac{1}{6}$ in. long; throat not oblique; teeth large, linear-subulate. Corolla-lips small.—*Schweinf. Beitr. Fl. Aethiop.* 123.

Nile Land. Cordofan: among shrubs, on the plain of Arashkol Mountain, *Kotschy*, 111! Katul Gombara, *Pfund*, 202! and without precise locality, *Kotschy*, 70! Abyssinia: in fields, near Gageros, 4000 ft., *Schimper*, 2158!

9. **L. microscypha**, *Baker*. A much-branched erect annual under 1 ft. high, with nearly glabrous stems. Leaves shortly petioled, ovate, under 1 in. long, inciso-crenate in the upper half, moderately firm, green and nearly glabrous on both surfaces. Whorls many-flowered, forming dense leafless terminal spicate panicles $\frac{3}{4}$ – $1\frac{1}{4}$ in. long; bracts large, rigid, linear-subulate. Calyx pubescent, $\frac{1}{6}$ in. long; tube campanulate; throat not at all oblique; teeth subulate, nearly as long as the tube. Corolla small. Stamens included.

Mozamb. Dist. British Central Africa: North Nyasaland, *Whyte!*

10. **L. masaiensis**, *Oliv. in Journ. Linn. Soc.* xxi. 403. A perennial herb, with short slender ascending thinly hairy stems. Leaves shortly petioled, small, obovate-cuneate, pubescent, crenate except at the base. Whorls solitary, terminal, many-flowered; bracts large, linear, densely rigidly ciliate. Calyx hairy, $\frac{1}{4}$ in. long; throat equal; teeth minute, deltoid-cuspidate. Corolla half as long again as the calyx; upper lip densely hairy.—*Oliv. in Hook. Ic. Pl.* xv. 74, t. 1495.

Nile Land. British East Africa: Lykipia, 6000–8000 ft., *Thomson!*

11. **L. venulosa**, *Baker*. A perennial herb, with slender shortly densely pilose branches. Leaves shortly petioled, thick, obovate-cuneate, $\frac{1}{2}$ – $\frac{3}{4}$ in. long, crenate in the upper half, greenish and thinly pilose above, densely pilose with raised veins beneath. Whorls few, many-flowered, remote, axillary; bracts large, subulate, hairy. Calyx hairy, narrowly funnel-shaped, $\frac{1}{6}$ in. long; throat not oblique; teeth minute, deltoid-cuspidate. Corolla twice as long as the calyx.

Nile Land. British East Africa: Ukamba, 5000–6000 ft., *Scott-Elliott*, 6463!

12. **L. Elliotii**, *Baker*. An annual, with slender erect branched finely pilose stems under 1 ft. long. Leaves sessile, obovate or the upper oblanceolate, $\frac{1}{2}$ – $\frac{3}{4}$ in. long, obtuse, crenate, pilose on both surfaces. Whorls few, distant, many-flowered, axillary; bracts large, subulate, densely pilose. Calyx funnel-shaped, hairy, $\frac{1}{6}$ in. long; throat not oblique; teeth small, deltoid, with a large cusp. Corolla twice as long as the calyx.

Nile Land. British East Africa: amongst long grass at Gilgil River, 6000–7000 ft., *Scott-Elliott*, 6566!

13. **L. Pechuelii**, *Baker*. A suffruticose perennial, with stems densely clothed with adpressed white hairs. Leaves shortly petioled, oblong, entire or obscurely crenate towards the tip, $1\frac{1}{2}$ in. long, densely clothed with adpressed hairs on both sides. Whorls 3–4-flowered; bracts subulate. Calyx densely clothed with white woolly hairs; teeth, 5 longer and subulate, and 5 intermediate $\frac{1}{2}$ – $\frac{1}{3}$ their length. Upper lip of corolla densely villous.—*Lasiocorys Pechuelii*, O. Kuntze in *Jahrb. Königl. bot. Gart. Berlin*, iv. 271.

Lower Guinea. German South-west Africa: Hereroland, *Peuchel-Loesche*.

14. **L. altissima**, *Engl. in Engl. Jahrb.* x. 268. A perennial herb, 3–4 ft. high, with stems densely clothed with soft white hairs. Leaves small, sessile, oblong, subentire, densely hairy on both sides. Whorls very numerous, many-flowered, the upper approximate; bracts minute. Calyx campanulate, $\frac{1}{8}$ in. long, densely clothed with soft white spreading hairs; throat not oblique; teeth 10, deltoid, the alternate ones smaller. Corolla-lip small; upper densely villous.—Hiern in *Cat. Afr. Pl. Welw.* i. 878.

Lower Guinea. Angola: Huilla, *Welwitsch*, 5484! Humpata, *Johnston*! Cunene River, *Johnston*! German South-west Africa: Hereroland; Otyimbingue, *Marloth*, 1410!

15. **L. inflata**, *Benth. in DC. Prod.* xii. 524. A branched erect perennial herb, woody at the base, with stems densely clothed with short soft white hairs. Leaves nearly sessile, suborbicular, crenate at the apex, $\frac{1}{2}$ –1 in. long, softly hairy on both sides. Whorls very numerous, 6–10-flowered, many of the upper approximate and with reduced leaves; bracts minute. Calyx campanulate, inflated, $\frac{1}{8}$ in. long, densely villous; throat not oblique; teeth deltoid, not cuspidate. Corolla twice as long as the calyx; upper lip densely villous at the tip.—*Schweinf. & Volk., Liste Pl. Somalis*, 12.

Nile Land. Nubia: Coast-land, 3000–4000 ft., *Bent*! near Suakin, at Gebel Uaratab, *Schweinfurth*, 141! at Hor Tamanib, 300 ft., *Lord*! Singat, *Schweinfurth*, 283! Somaliland: Salul River, *Ghika*.

Also in Arabia.

16. **L. Jamesii**, *Baker in Kew Bulletin*, 1895, 225. A perennial, with woody obscurely tomentose stems. Leaves shortly petioled, lanceolate, acute, subentire, cuneate at the base, subglabrous above, thinly pubescent beneath. Whorls many, many-flowered; bracts minute. Calyx funnel-shaped, thinly hairy, $\frac{1}{8}$ in. long, deeply 10-ribbed; teeth minute. Upper lip of the corolla short, densely villous.

Nile Land. Somaliland: Zafarag, *James & Thrupp*! and without precise locality, *Miss Edith Cole*! *Mrs. Lort-Phillips*!

17. **L. milaniana**, *Gürke in Engl. Jahrb.* xxii. 141. A perennial herb, with slender shortly hairy stems. Leaves distant, small, sessile, lanceolate or oblong-lanceolate, entire or crenate, slightly hairy, narrowed to the base. Whorls few, distant, many-flowered; bracts minute. Calyx hairy, funnel-shaped, $\frac{1}{8}$ in. long, finely ribbed; throat subequal; teeth all minute. Corolla-lip $\frac{1}{8}$ in. long, densely villous.

Mozamb. Dist. Portuguese East Africa: Makua Country, on the Namuli Hills, *Last*! Beira, *Braga*, 7, 109. British Central Africa: Nyasaland; North Nyasaland and Upper Loangwa River, at Fort Young, *Nicholson*! Blantyre, *Buchanan*, 23! 25! Manganja Hills, *Meller*! Ndirandi Mountain, near Blantyre, *Scott-Elliott*, 8578! Plateau of Mount Zomba, 5000–6000 ft., *Whyte*! Mount Malosa, 4000–6000 ft., *Whyte*! Mount Mlanje, *Whyte*! and without precise locality, *Buchanan*, 537!

18. **L. Welwitschii**, *Gürke in Engl. Jahrb.* xxii. 141. A perennial herb, with slender shortly hairy stems. Leaves nearly sessile, suborbicular or broadly ovate, distinctly crenate, about 1 in. long, thinly hairy on both sides. Whorls few-flowered, confined to the upper nodes; bracts minute. Calyx hairy, funnel-shaped, $\frac{1}{6}$ in. long; throat subequal; teeth deltoid-cuspidate. Corolla-lips as long as the calyx, densely villous. —Hiern in *Cat. Afr. Pl. Welw.* i. 876.

Lower Guinea. Angola, *Welwitsch*, 5563!

19. **L. tomentosa**, *Gürke in Engl. Pfl. Ost-Afr. C.* 343. A tomentose undershrub 4–5 ft. high, with ascending branches. Leaves sessile, oblanceolate, deeply crenate towards the obtuse apex, pubescent on the upper surface, tomentose beneath. Whorls many-flowered. Calyx densely villous; throat subequal; teeth deltoid-cuspidate. Corolla white.

Mozamb. Dist. German East Africa: Kilimanjaro; between the Pangani and Himo Rivers, 2000–2500 ft., teste *Gürke*.

20. **L. martinicensis**, *R. Br.; Benth. in DC. Prod.* xii. 533. An erect branched annual herb, 2–3 ft. high, with pubescent branches. Leaves oblong, thin, petioled, distinctly crenate, hairy on both sides, sometimes 2–3 in. long. Whorls very dense, remote; bracts large, subulate. Calyx very hairy, $\frac{1}{6}$ (finally $\frac{1}{4}$) in. long; throat oblique; upper lip produced; teeth subulate, unequal, the largest finally $\frac{1}{6}$ in. long. Corolla small, fugitive.—A. Rich. *Tent. Fl. Abyss.* ii. 200; Vatke in *Oester. Bot. Zeitschr.* 1875, 95; Oliv. in *Trans. Linn. Soc.* xxix. 139; Schweinf. *Beitr. Fl. Aethiop.* 123; Hook. f. *Fl. Brit. Ind.* iv. 688; Zarb, *Cat. Spéc. Bot. Pfund*, 33; *Engl. Hochgebirgsfl. Trop. Afr.* 370; Hiern in *Cat. Afr. Pl. Welw.* i. 876; *L. Schimper*, *Hochst. ex A. Br. in Flora*, 1841, i. 279; *Avetta in Ann. Istit. Bot. Roma*, vi. 61.

Upper Guinea. Senegal, *Leprieur* (?) 122! Gambia, *Brown-Lester*, 40! *Ingram*!

Nile Land. Nubia: Hor Tamanib, near Suakin, *Lord*! Cordofan: Obeid, *Pfund*, 22! Eritrea: Bogos; Keren, *Steudner*, 1404! Shohos country, *Ehrenberg*; Habab, 5800 ft., *Hildebrandt*. Galabat: region of Matamma, *Schweinfurth*, 148! Sennar, *Prince of Wurtemberg*. Abyssinia: Tigre; Hamedo, 5200 ft., *Schimper*, 139, near Adowa, *Schimper*, 15! Shire; on the banks of the River Tacazze, *Petit*, 124! Shoa; Fiume Havasch, near Mount Bosset, cultivated specimen, *Ragazzi*; Samen; Jaja, 6500 ft., *Schimper*, 283, Ataba, *Steudner*, 1409; and without precise locality, *Schimper*, 261! Somaliland: near Harar, *Hardegger & Paulitschke*. British Somaliland, without precise locality, *Mrs. Lort-Phillips*! British East Africa: Jur; Jur Ghattas, *Schweinfurth*, 2406! Toru district, near Ruwenzori, at Kivata, *Scott-Elliott*, 7653!

Lower Guinea. Angola, *Welwitsch*, 5503! 5542! 5586B.

Mozamb. Dist. Pemba Island, *Bojer*! German East Africa: Uniamwezi; Miningu, *Speke & Grant*, 181! and Muhulalo, ex *Gürke*. Kilimanjaro; Marangu, 4800 ft., *Volkens*, 606! Usambara; Amboni, *Holst*, 2812! Usaramo, *Stuhlmann*! British Central Africa: Northern Zambesia; Boruna, *Menyharth*, 971! Nyasaland; Masuka Plateau, 6500–7000 ft., *Whyte*! and without precise locality, *Buchanan*, 79!

A cosmopolitan tropical weed.

21. **L. ebracteata**, *Wawra & Peyr. in Sitzb. Acad. Wien, Math-Nat.* xxxviii. 577. An annual herb, with softly pubescent stems 1–2 ft. long, branched from the base. Leaves distinctly petioled, ovate, obtuse or acute, 1–1½ in. long, deeply inciso-crenate, softly pubescent on both surfaces. Whorls 5–6-flowered; bracts obsolete. Calyx 4–5 lin. long, pubescent; throat oblique, produced on the lower side. Corolla whitish; tube ¼ in. long; upper lip as long as the tube.—Gürke in *Engl. Jahrb.* xxii. 139; Hiern in *Cat. Afr. Pl. Welw.* i. 877.

Lower Guinea. Angola: Benguela; on the borders of woods near Benguela, *Wawra*, 292; Mossamedes, *Capello*, 5, *Welwitsch*, 5501! 5516! 5517, Chella Mountains, *Johnston*!

22. **L. Holstii**, *Gürke in Engl. Pfl. Ost-Afr. C.* 342. A much-branched perennial, with ascending pubescent branchlets. Leaves distinctly petioled, ovate, 2–4 in. long, acuminate, rounded or narrowed to the base, deeply crenate, pubescent on both surfaces. Whorls dense, many-flowered, 1¼–1½ in. diam., aggregated in a terminal head, subtended by much-reduced leaves; proper bracts obsolete. Calyx-tube ¼ in. long; throat very oblique; teeth deltoid-cuspidate. Corolla white; upper lip ½ in. long.

Mozamb. Dist. German East Africa: Usambara; Lutindi, 4800–5000 ft., *Holst*, 3312! Kwa Mshuza, *Holst*, 8925!

23. **L. neufizeana**, *Courb. in Ann. Sc. Nat.* 4, sér. xviii. 145. An annual, with erect densely hairy stems ½–1 ft. long. Leaves sessile, oblong-lanceolate, hairy, deeply crenate, the lower 1–2 in. long. Whorls many, 8–12-flowered, the upper approximate, the lower spaced out; bracts minute. Calyx densely hairy, ⅙–¼ in. long; lower side produced; teeth deltoid-cuspidate. Corolla-lips small.—Britten in Gregory, *Great Rift Valley*, 396. *L. paucicrenata*, *Vatke in Linnæa*, xliii. 98.

Nile Land. Nubia: about 21° N. lat., coast-land up to between 3000 and 4000 ft., *Bent*! Dessi Island, in Annesley Bay, *Courbon*. Eritrea: near Saati, *Schweinfurth & Riva*, 327! Abyssinia, *Ehrenberg*! British East Africa: Taita; Maungu Mountain, 2000 ft., *Johnston*! Ndara, *Hildebrandt*, 2404! Ukamba; Kitui, *Hildebrandt*, 2744. Kilimanjaro expedition, 40–60 miles from the coast, *Johnston*! Ngurunga Kifaniko, south of Tzavo, *Gregory*, Bondoni, *Gregory*, Kapte, Plains, *Gregory*.

Mozamb. Dist. German East Africa: Kilimanjaro; Lake Chala, *Volkens*, 305! Also in Socotra.

24. **L. Schweinfurthii**, *Gürke in Engl. Jahrb.* xxii. 136. A perennial herb, with long simple stems, densely clothed with short white hairs. Leaves sessile, oblong, moderately firm, pubescent on both sides, about 1 in. long, with a few shallow obtuse teeth in the upper half. Whorls many, distant, few-flowered; bracts linear, minute. Calyx finely pubescent, ½ in. long; throat oblique, produced on the lower side; teeth deltoid, minute. Corolla not seen.

Nile Land. British East Africa: Niamniam; Baginse Mountain, *Schweinfurth*, 3823!

25. **L. concinna**, *Baker*. A much-branched perennial, with stems glabrous except towards the top. Leaves sessile or shortly petioled, small, ovate, slightly crenate, obscurely hairy. Whorls distant, few-flowered; bracts minute. Calyx-tube hairy, $\frac{1}{6}$ in. long; lowest side produced; teeth unequal, subulate, the lowest $\frac{1}{6}$ in. long. Corolla twice as long as the calyx-tube; upper lip very hairy.

Nile Land. British East Africa: Mombasa, *Wakefield*!

Nearly allied to *L. glabrata* and *L. microphylla*.

26. **L. microphylla**, *Vatke in Linnæa*, xliii. 97. Perennial. Leaves small, sessile, ovate, crenate, the longest above $\frac{1}{2}$ in. long. Whorls 2-3-flowered; bracts minute. Calyx hispid, $\frac{1}{3}$ in. long; mouth sub-oblique; teeth 10, subequal, subulate. Corolla-tube callosos-annulate inside.

Nile Land. British East Africa: Duruma, *Hildebrandt*, 2336.

Mozamb. Dist. German East Africa: Usambora; Masheua, *Holst*, 3561!

27. **L. orbicularis**, *Gürke in Engl. Pfl. Ost-Afr. C.* 343. An erect herb, with velvety-pubescent stems. Leaves sessile, orbicular or broadly ovate, under 1 in. long, rounded at the apex, cuneate at the base, crenate, very thick, velvety on both surfaces. Whorls many-flowered, congested at the ends of the branches; bracts minute, setaceous. Calyx $\frac{1}{2}$ in. long, very oblique at the throat; teeth 10, short. Corolla reddish-white.

Mozamb. Dist. German East Africa: Karagwe, *Stuhlmann*, 1819, common on the tops of the Karagwe hills, 4000-5000 ft., *Scott-Elliot*, 7514!

28. **L. decurvata**, *Baker ex Hiern in Cat. Afr. Pl. Welw.* i. 876. Stem long, slightly hairy. Leaves thin, shortly petioled, oblong-lanceolate, the lower $1\frac{1}{2}$ -2 in. long, crenate above the cuneate base, slightly hairy on both surfaces. Whorls few, distant, dense, many-flowered; bracts minute. Calyx $\frac{1}{3}$ in. long, much deflexed in a late stage; throat oblique; lower lip produced, with 3 deltoid teeth.

Lower Guinea. Angola, *Welwitsch*, 5526! 5554.

29. **L. Junodii**, *Briquet in Ann. Jard. Bot. Genève.* ii. (1898) 109. A herb about 1 ft. high, with branches hispid on the angles. Leaves petioled, ovate-oblong, 1- $1\frac{1}{2}$ in. long, subobtuse, green on both surfaces with scattered rigid hairs, with 2-4 large teeth on each side. Whorls axillary, 10-flowered; pedicels absent; bracts minute, spinous. Calyx $\frac{1}{3}$ - $\frac{1}{2}$ in. long; throat produced on the lower side; 7 upper teeth lanceolate; 3 lower lanceolate-deltoid. Corolla rose-red, produced $\frac{1}{2}$ in. from the throat of the calyx.

Mozamb. Dist. Portuguese East Africa: Mozambique; hills of Rikalla, *Junod*, 92.

30. **L. lanata**, *Baker*. A perennial herb, with stem densely clothed with soft white hairs. Leaves shortly petioled, ovate-oblong, $1\frac{1}{2}$ -2 in.

long, cuneate at the base, deeply crenate, thinly clothed with soft white hairs above, densely so beneath. Whorls dense, many-flowered, produced from the axils of reduced upper leaves; bracts minute or obsolete. Calyx-tube funnel-shaped, $\frac{1}{6}$ in. long, densely clothed with white hairs; throat oblique; lower lip produced, its teeth deltoid. Corolla densely villous, twice as long as the calyx-tube.

Nile Land. British East Africa: Kikuyu; Kidung Valley, 6000 ft., *Scott-Elliott*, 6585!

31. **L. glabrata**, *R. Br.*; *Benth. in DC. Prod.* xii. 524. A branched erect perennial herb, with slender subglabrous stems. Leaves petioled, ovate, acute, deeply crenate, thin, nearly glabrous, the lower 2–3 in. long. Whorls distant, few-flowered; bracts minute. Calyx narrowly funnel-shaped, glabrous or slightly hairy, $\frac{1}{3}$ in. long; throat oblique; lower lip produced; teeth deltoid, with very large cusps. Corolla-tube slightly exserted; upper lip obovate-cuneate, $\frac{1}{6}$ in. long, densely villous.—*A. Rich. Tent. Fl. Abyss.* ii. 199; *Jaub. & Spach, Ill. Pl. Orient.* t. 385; *Vatke in Oester. Bot. Zeitschr.* 1875, 95; *Schweinf. Beitr. Fl. Aethiop.* 123; *Zarb, Cat. Spéc. Bot. Pfund*, 33; *Britten in Gregory, Great Rift Valley*, 396; *Engl. Hochgebirgsfl. Trop. Afr.* 370. *L. galeopsidea*, *Hochst. ex A. Rich. Tent. Fl. Abyss.* ii. 199.

Nile Land. Dalak Island, *Ehrenberg*. Eritrea: Bogos; Keren, *Steudner*, 1417! Shohos Country, *Ehrenberg, Pfund*. Abyssinia: Togodele, *Ehrenberg!* Tigre; near Jelajeranne, *Schimper*, 764! Tacazze Valley, *Quartin-Dillon*; and without precise locality, *Schimper*, 208! 388! British East Africa: Taita; Maungu Mountain, 2000 ft., *Johnston!* Kamasia, *Gregory*.

Mozamb. Dist. German East Africa: Usaramo, *Stuhlmann!*

Also Natal, Delagoa Bay, and Arabia.

32. **L. thymoides**, *Baker in Kew Bulletin*, 1895, 226. A perennial herb, with slender pubescent branches. Leaves petioled, ovate, $\frac{1}{4}$ – $\frac{1}{3}$ in. long, crenate, densely pubescent on both surfaces. Whorls few, few-flowered, subtended by small leaves; pedicels very short; bracts minute, subulate. Calyx pilose, $\frac{1}{3}$ in. long; tube funnel-shaped, 10-ribbed; limb oblique, produced on the lower side; teeth small, lanceolate. Corolla $\frac{1}{2}$ – $\frac{5}{8}$ in. long; tube cylindrical; upper lip lingulate, densely pilose, as long as the tube; lower smaller, 3-lobed. Stamens not exserted from the upper lip.

Nile Land. British Somaliland: without precise locality, *Mrs. Lort-Phillips!*

33. **L. pratensis**, *Vatke in Linnæa*, xliii. 97. A perennial herb, with long slender thinly hairy stems. Leaves small, thin, petioled, ovate, crenate, hairy on both sides. Whorls few, few-flowered, the lower very distant, the upper approximate and their leaves reduced; bracts minute. Calyx hairy, $\frac{1}{4}$ in. long; lower side produced; teeth deltoid-cuspidate. Upper lip of corolla nearly as long as the calyx, densely villous.

Nile Land. British East Africa: Taita; Ndara, *Hildebrandt*, 2410!

34. **L. paucijuga**, *Baker in Kew Bulletin*, 1895, 226. A perennial herb, with slender pubescent stems. Leaves few, remote, shortly petioled, ovate, $\frac{3}{4}$ –1 in. long, deeply crenate, rounded at the base, green and pubescent on both surfaces. Whorls few-flowered, subtended by large leaves; pedicels very short; bracts small, rigid, linear-subulate. Calyx pilose, $\frac{1}{3}$ in. long; tube funnel-shaped, 10-ribbed; limb oblique, produced on the lower side; teeth small, deltoid. Corolla-tube cylindrical, as long as the calyx; upper lip lingulate, as long as the tube; leaves small. Stamens not exerted from the upper lip.

Nile Land. British Somaliland: without precise locality, *Mrs Lort-Phillips!*

35. **L. shirensis**, *Baker*. A perennial herb, with stems thinly clothed with short spreading hairs. Leaves shortly petioled, ovate, acute, crenate, thin, thinly clothed with short spreading hairs, the lower $1\frac{1}{2}$ –2 in. long. Whorls few, few-flowered; bracts minute. Calyx densely ribbed, $\frac{1}{4}$ – $\frac{1}{3}$ in. long, clothed with spreading hairs; throat oblique, lower side produced; upper teeth small, lanceolate; lower deltoid-cuspidate. Upper lip of corolla $\frac{1}{4}$ in. long, densely hairy.

Mozamb. Dist. Portuguese East Africa: Shamo, near the mouth of the River Shire, *Kirk!*

36. **L. nepetoides**, *Baker*. A perennial herb, with slender finely pubescent stems. Leaves shortly petioled, ovate, crenate, very pubescent, especially beneath, at most 1 in. long. Whorls 2, many-flowered; bracts minute. Calyx laxly hairy, $\frac{1}{3}$ in. long; throat oblique, produced on the lower side; teeth deltoid-cuspidate. Upper lip of the corolla $\frac{1}{6}$ in. long.

Nile Land. British East Africa: Kapte Plateau, 5000–6000 ft., *Thomson!*

37. **L. densiflora**, *Vatke in Oester. Bot. Zeitschr.* 1875, 95. A perennial herb 3–4 ft. high, with shortly hairy stems. Leaves petioled, ovate, acute, distinctly crenate, thin, slightly hairy, the lower $1\frac{1}{2}$ –2 in. long. Whorls many, many-flowered, 1 in. diam., the upper confluent, with their leaves much reduced; bracts minute. Calyx $\frac{1}{3}$ in. long, very hairy; lower side produced; teeth minute, deltoid-cuspidate. Corolla not seen.

Mozamb. Dist. Island of Zanzibar at Kokotoni, on coralline-limestone hills, *Hildebrandt*, 999!

38. **L. trachyphylla**, *Jaub. & Spach, Ill. Pl. Orient. t.* 386. A perennial herb, with slender finely hairy stems. Leaves shortly petioled, ovate, crenate, 1 in. long, scabrous above, pubescent beneath. Whorls distant, 6–10-flowered; bracts minute. Calyx hairy, $\frac{1}{3}$ in. long, produced on the lower side; throat oblique; teeth lanceolate. Corolla $\frac{1}{2}$ in. long; upper lip as long as the tube.—*Vatke in Linnæa*, xliii. 97.

Nile Land. British Somaliland: Ahl Mountains, near Maid, 3900 ft., *Hildebrandt*, 1423.

Also in Arabia.

39. **L. lamioides**, *Baker*. A perennial herb, with stems clothed with short spreading hairs. Leaves petioled, ovate, acute, deeply crenate, cuneate and entire at the base, thin, slightly hairy, the lower 2–3 in. long. Whorls distant, dense, many-flowered; bracts small. Calyx slightly hairy, $\frac{1}{4}$ – $\frac{1}{3}$ in. long; throat oblique; lower lip produced; teeth deltoid-cuspidate. Upper lip of the corolla $\frac{1}{6}$ in. long, densely hairy.

Mozamb. Dist. British Central Africa: Nyasaland; without precise locality, *Buchanan*, 482!

40. **L. Fleckii**, *Gürke in Engl. Jahrb.* xxii. 140. Stem erect, pubescent, simple or slightly branched. Leaves sessile or subsessile, linear-lanceolate, 2 in. long, $\frac{1}{3}$ – $\frac{1}{2}$ in. broad, subacute, irregularly serrate, pubescent on both surfaces. Whorls few-flowered; bracts subulate, hairy, shorter than the calyx. Fruit-calyx $\frac{1}{3}$ in. long; throat oblique; teeth all subulate.

Lower Guinea. German South-west Africa: Damaraland, *Fleck*, 733.

Also in Namaqualand, south of the Tropic.

41. **L. Bakeri**, *Hiern in Cat. Afr. Pl. Welw.* i. 877. A branched erect annual, with slender shortly hairy stems. Leaves distant, sessile, linear, subentire, thinly hairy on both sides, 1–2 in. long. Whorls distant, many-flowered; bracts linear, shorter than the calyx, densely and rigidly ciliate. Calyx very hairy, $\frac{1}{3}$ in. long; throat oblique; lower side produced; teeth lanceolate-deltoid, pungent, $\frac{1}{12}$ in. long. Corolla not seen.

Lower Guinea. Angola: *Welwitsch*, 3232! 5512! 5513!

42. **L. stricta**, *Baker*. A much-branched erect annual, with long straight hairy slender stems. Leaves distant, sessile, linear or lanceolate, subentire or inciso-crenate, 2–4 in. long, thinly hairy on both sides. Whorls few, distant, many-flowered; bracts large, linear, rigidly and densely ciliate. Calyx-tube densely hairy, $\frac{1}{4}$ in. long; throat oblique; lower side much produced; teeth deltoid, with large spinous cusps. Lips of corolla $\frac{1}{4}$ in. long; upper densely hairy.—*L. glabrata*, *Britten in Trans. Linn. Soc. ser. 2, Bot. iv.* 37, not of R. Br.

Mozamb. Dist. Portuguese East Africa: Lower Zambesi; opposite Sena, *Kirk!* Shiramba, *Kirk!* British Central Africa: Nyasaland; between the Songwe River and Karonga, 1700–2000 ft., *Whyte*, 5! Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte!* Mount Mlanje, *Whyte!* and without precise locality, *Buchanan*, 706!

43. **L. villosa**, *Gürke in Engl. Jahrb.* xxii. 137. Stem erect, branched, villous. Leaves sessile, linear-lanceolate, 2–2 $\frac{1}{2}$ in. long, $\frac{1}{5}$ – $\frac{1}{3}$ in. broad, obtuse, narrowed to the base, crenate upwards, subcoriaceous, covered with long hairs on both surfaces. Whorls many-flowered; bracts linear-subulate, above $\frac{1}{2}$ in. long. Calyx hairy, $\frac{2}{3}$ in. long when in fruit; throat very oblique, produced on the lower side; 3 upper teeth

lanceolate, 7 lower deltoid, all mucronate. Corolla nearly 1 in. long; upper lip only villous.

Mozamb. Dist. German East Africa: Ukwere district, in Usaramo, *Stuhlmann*, 8412. British Central Africa; Nyasaland: Fort Hill, Tanganyika Plateau, 4500 ft., *Whyte*!

44. **L. stenophylla**, *Gürke in Engl. Jahrb.* xxii. 138. Stem erect, little branched, villous. Leaves sessile, linear-lanceolate, 3–4 in. long, $\frac{1}{4}$ – $\frac{1}{3}$ in. broad, acuminate, obscurely serrate upwards, clothed with adpressed hairs on both surfaces. Whorls many-flowered; bracts linear, mucronate, hispid, above $\frac{1}{2}$ in. long. Fruit-calyx pubescent, nearly 1 in. long; throat very oblique, produced on the lower side; calyx-teeth mucronate; 3 upper linear, erect; 7 lower reflexed, of them the 3 central ovate-lanceolate. Corolla 1 in. long; upper lip villous.

Mozamb. Dist. German East Africa: Ukami; near Gwala, 600 ft., *Stuhlmann*, 8157, 8158.

45. **L. Nyassæ**, *Gürke in Engl. Jahrb.* xxii. 137. A perennial, with long branched densely hairy stems. Leaves nearly sessile, linear-oblong, densely hairy on both sides, obscurely crenate, the lower 2–3 in. long. Whorls solitary, terminal on the branches, many-flowered, $1\frac{1}{2}$ in. diam.; bracts large, linear, very hispid. Calyx very hairy; tube $\frac{1}{2}$ in. long; throat oblique, produced on the lower side; upper teeth deltoid; lower lip with larger cusps. Upper lip of corolla $\frac{1}{3}$ in. long, densely villous.

Mozamb. Dist. British Central Africa: Urungu; Fwambo, 5200 ft., *Nutt*! Nyasaland; Shire Highlands, between Blantyre and Zomba, *Buchanan*, 158! 460! and without precise locality, *Buchanan*, 255! Northern Zambesia; Batoka Highlands, near Victoria Falls, *Kirk*!

Near *L. indica*, R. Br.

46. **L. Descampsii**, *Briquet in Bull. Soc. Bot. Belg.* xxxvii. 59. Stem robust, with long internodes, scabrous with rigid ascending or spreading hairs. Leaves sessile or subsessile, oblong-lanceolate, acuminate, $1\frac{1}{2}$ –2 in. long, closely crenate, narrowed to the base, dark green, thinly clothed with long spreading hairs. Whorl of flowers dense, solitary, terminal, 1 in. diam.; bracts large, lanceolate, ciliate on the margin. Calyx sessile, $\frac{1}{3}$ in. long in flower; throat oblique, produced on the lower side; 3 lower teeth linear-lanceolate, $\frac{1}{6}$ in. long; 7 upper much smaller, deltoid. Corolla protruding $\frac{1}{3}$ in. from the throat of the calyx; lips $\frac{1}{4}$ in. long.

South Central. Congo Free State: Upper Congo; Moliro, *Descamps*.

47. **L. tettensis**, *Vatke in Linnæa*, xl. 180. An erect annual herb, with pubescent stems 2–3 ft. long. Leaves subsessile, oblong-lanceolate or linear, $2\frac{1}{2}$ –3 in. long, $\frac{1}{3}$ – $\frac{1}{2}$ in. broad, hairy on both surfaces, faintly crenate. Whorls terminal, few or solitary, many-flowered, nearly 1 in. in diam.; bracts linear, hispid. Calyx hispid, with a

very oblique throat, in flower longer than the bracts, finally nearly 1 in. long; lower teeth subdeltoid; upper linear. Corolla white, slightly longer than the calyx, densely villous.

Mozamb. Dist. Portuguese East Africa: mainland opposite the Island of Mozambique, *Peters*; Lower Zambesi; Tete, *Peters*; Rios de Sena, *Peters*!

48. **L. oligocephala**, *Hook. f. in Journ. Linn. Soc.* vii. 213. A perennial herb, with slender hairy stems 2–4 ft. long. Leaves small, sessile, firm, oblong, crenate, densely hairy. Whorls 1–2, many-flowered; bracts linear, densely ciliate, half as long as the calyx. Calyx densely hairy, $\frac{1}{4}$ – $\frac{1}{3}$ in. long; lower lip much produced; lower teeth deltoid-cuspidate; upper small, lanceolate. Corolla lips small.—*Engl. Hochgebirgsfl. Trop. Afr.* 370; *Dewèvre in Comptes-rendus Soc. Bot. Belg.* xxxiii. 105; *Britten in Gregory, Great Rift Valley*, 396.

Nile Land. British East Africa: Taita; Ndi Mountain, *Gregory*.

Upper Guinea. Cameroons: Cameroon Mountain, 7000–8000 ft., *Mann*, 1220! 1987!

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, *Holst*, 9080! British Central Africa: Nyasaland; Blantyre, *Descamps*.

49. **L. calostachys**, *Oliv. in Trans. Linn. Soc.* xxix. 139, t. 83. A perennial, with densely hairy stems, woody towards the base. Leaves nearly sessile, oblong, $1\frac{1}{2}$ –2 in. long, crenate in the upper half, thinly hairy above, densely and softly hairy beneath. Whorls many, many-flowered, approximate, 1 in. diam., their leaves much reduced; bracts setaceous, half as long as the calyx. Calyx hairy, $\frac{1}{3}$ in. long; throat oblique; lower side produced; teeth deltoid. Corolla half as long again as the calyx; upper lip densely villous.

Nile Land. British East Africa: Madi; Gani downs, *Speke & Grant*!

Mozamb. Dist. German East Africa: Karagwe; near streams, *Speke & Grant*!

Lower Guinea. Angola: Malange, *Mechow*, 348, fide *Briquet*.

50. **L. leucotricha**, *Baker*. A perennial herb. Stems densely clothed with short soft white hairs. Leaves subsessile, ovate, crenate, thin, softly pubescent, especially beneath, the lower 3 in. long. Whorls many, distant, very dense; bracts ovate, acute, half as long as the calyx. Calyx very hairy, $\frac{1}{3}$ in. long; throat oblique; lower side produced; teeth small, deltoid. Upper lip of corolla very hairy, $\frac{1}{4}$ in. long.

Nile Land. British East Africa: Taita; Mwatate, 2000 ft., *Johnston*! Maungu Mountain, 2000 ft., *Johnston*!

51. **L. grandis**, *Vatke in Linnæa*, xliii. 96. An erect perennial herb, with densely hairy stems. Leaves sessile or subsessile, ovate, 1 – $1\frac{1}{2}$ in. long, strongly crenate. Whorls globose, many-flowered, approximate; bracts large, linear, hairy. Calyx 10-ribbed, finally $\frac{1}{2}$ in. long; throat oblique; lower lip produced; upper teeth very short;

lower deltoid-cuspidate. Corolla-tube naked inside.—Gürke in Engl. Pfl. Ost-Afr. C. 342.

Nile Land. British East Africa: Taita; Ndara, *Hildebrandt*, 2423, Maungu Mountain, 4500–5000 ft., ex *Gürke*.

Mozamb. Dist. German East Africa: Usambara; Kwa Mshuza, *Holst*, 9100!

52. **L. fasciculata**, *Baker*. An undershrub, with densely and shortly pilose woody branches. Leaves very small, sessile, fascicled, obovate-cuneate, thick, crenate in the upper half, green and thinly pilose above, densely clothed with soft white hairs beneath. Whorls numerous, many-flowered, crowded, forming a terminal subspicate panicle 3–4 in. long; bracts large, subulate, rigid. Calyx hairy, $\frac{1}{4}$ in. long; throat oblique; lower lip produced, its teeth small, deltoid. Corolla not much longer than the calyx.

Nile Land. British East Africa: on grassy plains near Masai River, 6000 ft., *Scott-Elliott*, 6784!

53. **L. Carsonii**, *Baker*. A much-branched annual, with slender erect finely hairy stems. Leaves shortly petioled, thin, distant, lanceolate, very acute, crenate in the upper half, thinly hairy on both sides 1–2 in. long. Whorls many-flowered, solitary, terminal; bracts large, linear, rigidly ciliate. Calyx thinly hairy, $\frac{1}{3}$ – $\frac{1}{2}$ in. long; throat oblique; lower side produced; teeth deltoid-cuspidate. Lips of corolla short; upper densely hairy.

Mozamb. Dist. Kavala Islands in Lake Tanganyika, *Carson*, 28!

54. **L. micrantha**, *Gürke in Engl. Jahrb.* xxii. 136. Stem erect, branched, tomentose or pubescent. Leaves petioled, lanceolate, the largest 3 in. long, above $\frac{1}{2}$ in. broad, acute, deeply crenate, clothed with adpressed hairs on both surfaces. Whorls many-flowered; bracts linear-subulate, hispid, $\frac{1}{3}$ – $\frac{1}{2}$ in. long; pedicels short. Calyx tomentose, $\frac{1}{3}$ – $\frac{1}{2}$ in. long; throat oblique, produced on the lower side; 5 lower teeth deltoid; 5 upper linear-lanceolate. Corolla small; upper lip villous.

Mozamb. Dist. German East Africa: Unyamwezi; Tabora, *Stuhlmann*, 575; Mwanza, on Lake Victoria at Smith Sound, *Stuhlmann*, 4605.

55. **L. bracteosa**, *Gürke in Engl. Jahrb.* xxii. 139. Stem erect, branched pubescent. Leaves shortly petioled, lanceolate, 3–4 in. long, under 1 in. broad, acute or acuminate, irregularly serrate, coriaceous, pilose on both surfaces. Whorls many-flowered, very distant; outer bracts broadly ovate, rather shorter than the calyx; inner lanceolate. Fruit-calyx hairy, above $\frac{1}{2}$ in. long; throat very oblique; teeth all mucronate, the lower deltoid, the upper lanceolate. Corolla glabrous except the upper lip.

Mozamb. Dist. German East Africa: west of Irangi, *Stuhlmann*, 4236.

56. **L. deflexa**, *Hook. f. in Journ. Linn. Soc.* vii. 213. A perennial herb, with shortly hairy stems 4–5 ft. long. Leaves shortly petioled,

oblong-lanceolate, 2–3 in. long, narrowed to the base, distinctly crenate, slightly hairy. Whorls 2–4, globose, very dense, $\frac{3}{4}$ –1 in. diam.; bracts as long as the calyx, rigid, linear, ciliate. Calyx very deflexed, hairy, $\frac{1}{4}$ in. long; lower lip produced; teeth deltoid. Corolla-lips very small.—Engl. Hochgebirgsfl. Trop. Afr. 370.

Upper Guinea. Cameroons: Cameroon Mountain, 7000 ft., *Mann*, 1232! 1976!

57. **L. Volkensii**, *Gürke in Engl. Pfl. Ost-Afr. C.* 342. An under-shrub 5–6 ft. high, with ascending pubescent branchlets. Leaves shortly petioled, oblong-lanceolate, 3–4 in. long, 1–1 $\frac{1}{2}$ in. broad at the middle, acute, narrowed to the base, finely crenate, densely pubescent on both surfaces. Whorls spaced out, axillary, dense, many-flowered, 1 in. diam.; bracts linear, rigid, as long as the calyx. Calyx-tube sub-campanulate, $\frac{1}{6}$ in. long; throat very oblique; teeth deltoid-cuspidate. Corolla white.

Mozamb. Dist. German East Africa: Kilimanjaro; at Kifinika Volcano and above Marangu, 8700 ft., *Volkens*, 1140!

58. **L. velutina**, *C. H. Wright*. Whole plant clothed with soft adpressed hairs. Stem branched. Leaves oblong-lanceolate, obtuse, slightly serrate, acute at the base, 3 in. long, 1 in. wide; petiole 3 lin. long, stout. Heads terminal, many-flowered; bracts 2, like the leaves, but smaller; bracteoles subulate, 6 lin. long. Calyx-tube 4 lin. long; upper lip with 3 subulate teeth; lower lip 2 $\frac{1}{2}$ lin. long, with 5–7 minute teeth. Corolla-tube 3 lin. long, slender; upper lip densely fringed with hairs; lower glabrous and strongly 2-nerved inside.

Mozamb. Dist. Portuguese East Africa: on dry hills between Unangu and Lake Shirwa, *Johnson*, 65!

59. **L. megasphæra**, *Baker in Kew Bulletin*, 1898, 163. A perennial herb. Stems slender, tetragonous, pubescent. Leaves shortly petioled, distant, oblong-lanceolate, 1–3 in. long, shallowly crenate, densely pilose on both surfaces. Whorls 1–2, many-flowered, subtended by large leaves; pedicels short; flower-bracts large, linear, densely pilose. Calyx densely pilose, above $\frac{1}{2}$ in. long; throat oblique, produced on the lower side; upper teeth linear; lower small, ovate, acuminate. Corolla-tube as long as the calyx; upper lip $\frac{1}{3}$ in. long, densely clothed with white hairs. Stamens not exerted.

Mozamb. Dist. British Central Africa: Nyasaland; Nyika Plateau, 6000–7000 ft., *Whyte*! Upper Loangwa River, at Fort Young, *Nicholson*! Namasi, *Cameron*, 10! Urungu; Fwambo, *Carson*!

60. **L. Coleæ**, *Baker in Kew Bulletin*, 1895, 226. A perennial herb, with a short erect pubescent branched stem. Leaves shortly petioled, ovate, $\frac{1}{2}$ – $\frac{3}{4}$ in. long, acute, crenate, green and pubescent on both surfaces. Whorls dense, solitary, terminal, many-flowered; pedicels very short; bracts large, linear, densely ciliate. Calyx pilose, $\frac{1}{3}$ in. long; tube subcylindrical, 10-ribbed; limb oblique, produced on

the lower side; teeth small, deltoid-cuspidate. Corolla $\frac{1}{2}$ in. long; tube cylindrical; both lips small. Stamens not exerted from the upper lip.

Nile Land. British Somaliland: without precise locality, *Miss Edith Cole!*

61. **L. kondowensis**, *Baker*. An erect branched herb, with slender finely pilose branches. Leaves shortly petioled, ovate, 1–2 in. long, acute, deeply crenate, green and thinly pilose above, densely pilose beneath. Whorls 1–2, remote, many-flowered; bracts large, linear, densely hairy. Calyx finely pubescent, $\frac{1}{3}$ in. long; throat oblique, lower side produced; tube funnel-shaped; teeth small, deltoid-cuspidate. Upper lip of corolla small, densely villous. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; between Kondowe and Karonga, 2000–6000 ft., *Whyte!*

62. **L. urticifolia**, *Benth. in DC. Prod. xii. 524*. An annual, with erect branched finely hairy stems $\frac{1}{2}$ –2 ft. long. Leaves thin, petioled, ovate, crenate, 1–2 in. long, finely hairy on both surfaces. Whorls distant, many-flowered, globose, $\frac{3}{4}$ in. diam.; bracts large, linear, subrigid, densely ciliate. Calyx finally $\frac{1}{3}$ in. long; lower lip produced; teeth deltoid. Corolla-tube naked inside; lips very small. —A. Rich. Tent. Fl. Abyss. ii. 199; Vatke in Oester. Bot. Zeitschr. 1875, 95; Schweinf. Beitr. Fl. Aethiop. 123; Terracciano in Ann. Istit. Bot. Roma, v. 101.

Nile Land. Dalak Island, *Ehrenberg*. Haressan Island in the Bay of Hamfila, *Terracciano*. Nubia: about 21° N. lat., sea-coast to between 3000 and 4000 ft., *Bent!* Eritrea: Habab district, 2000 ft., *Hildebrandt*, 691; Mount Zibo, near Saati, *Schweinfurth & Riva*, 529! Abyssinia, *Salt*.

63. **L. Whytei**, *Baker*. An erect perennial. Stems thinly clothed with fine spreading hairs. Leaves distinctly petioled, ovate, 2–3 in. long, membranous, inciso-crenate, green and thinly pilose above, densely pilose beneath. Whorls several, very distant, many-flowered; bracts large, linear-subulate, ciliate with bristly hairs. Calyx finely pubescent, $\frac{1}{2}$ in. long; throat very oblique, lower side produced; upper teeth lanceolate; lower deltoid, cuspidate. Upper lip of corolla $\frac{1}{4}$ in. long, densely villous. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; between Kondowe and Karonga, 2000–6000 ft., *Whyte!*

64. **L. mollis**, *Baker*. A perennial herb. Stems densely clothed with soft white hairs. Leaves petioled, ovate, $1\frac{1}{2}$ –2 in. long, obtuse, crenate, green and thinly hairy above, densely clothed with soft white hairs beneath. Whorls many, distant, many-flowered; bracts large, linear, pilose. Calyx $\frac{1}{2}$ in. long, densely hairy; throat oblique; lower lip produced, its teeth deltoid, not cuspidate. Corolla white, not much longer than the calyx; upper lip small, densely villous.

Nile Land. British East Africa: Ukamba, 6000 ft., *Scott-Elliott*, 6748!

65. **L. bukobensis**, *Gürke in Engl. Jahrb.* xxii. 139. Stem erect, branched, villous. Leaves shortly petioled, ovate, $1\frac{1}{2}$ –2 in. long, acute, narrowed to the base, deeply toothed, pubescent or villous on both surfaces. Whorls many-flowered; bracts linear-subulate, about as long as the calyx. Fruit-calyx pubescent, $\frac{1}{3}$ – $\frac{1}{2}$ in. long; throat oblique; teeth deltoid, cuspidate; lower lip deflexed.

Mozamb. Dist. German East Africa: Karagwe; Bukoba, on Lake Victoria, 3600 ft., *Stuhlmann*, 1572.

66. **L. somaliensis**, *Vatke in Linnæa*, xl. 181. A much-branched perennial. Stems clothed with yellowish tomentum. Leaves sub-orbicular, shortly petioled, $\frac{1}{4}$ in. long and broad, crenate-dentate, densely villous on both sides. Whorls few, many-flowered, crowded, nearly 1 in. in diam.; bracts subulate, villous. Calyx in fruit $\frac{1}{3}$ in. long, densely villous; throat oblique, produced on the lower side; upper lip entire or emarginate; teeth of the lower short, mucronate. Corolla twice as long as the calyx, densely villous.—*L. indica*, *Vatke in Oester. Bot. Zeitschr.* 1875, 95, not of R. Br.

Nile Land. British Somaliland: Ahl Mountains, 3200–6500 ft., *Hildebrandt*, 851.

38. LEONOTIS, Pers.; Benth. et Hook. f. *Gen. Plant.* ii. 1214.

Calyx-tube funnel-shaped, arcuate, 8–10-ribbed; throat oblique; teeth 8–10, more or less unequal, the upper the largest. Corolla-tube as long as the calyx; limb bilabiate; upper lip elongated, concave, hairy outside; lower short, deflexed, with 3 subequal lobes. Stamens 4, didynamous, arcuate; lower pair longest; anthers 2-celled; cells divaricate, subconfluent. Disk equal. Style shortly bifid. Nucules ovoid-triquetrous, obtuse or truncate, glabrous.—Coarse, tall, annual or perennial herbs. Leaves petioled, ovate, crenate. Whorls very dense, axillary. Flowers white or yellow.

Species, about 12, several in South Africa, one now cosmopolitan in the Tropical zone.

Annuals with thin nearly glabrous leaves.

Corolla pale yellow 1. *L. pallida*.

Corolla deep bright yellow 2. *L. nepetaefolia*.

Perennials with densely hairy leaves.

Corolla white 3. *L. Melleri*.

Corolla usually bright orange-yellow.

Leaves sessile 4. *L. Leonurus*.

Leaves petioled.

Calyx-teeth very unequal.

Leaves with fine grey pubescence beneath 5. *L. velutina*.

Leaves with dense soft grey hairs beneath 6. *L. Elliotii*.

Leaves densely clothed with soft white hairs beneath 7. *L. mollissima*.

Calyx-teeth subequal 8. *L. decadonta*.

Perennial with slightly hairy leaves 9. *L. dubia*.

Perennial with glabrous leaves 10. *L. Schinzii*.

1. **L. pallida**, *Benth. in DC. Prod.* xii. 535. A branched annual herb reaching 4–5 ft. in height, with finely hairy stems. Leaves distinctly petioled, thin, ovate, crenate, finely hairy on the ribs beneath, the lower 3–4 in. long. Whorls very dense, 2–2½ in. diam.; bracts lanceolate, rigid spine-tipped. Calyx-tube ¼–½ in. long, finely pubescent; teeth deltoid-cuspidate, spine-tipped, the uppermost the largest, ⅙ in. long. Upper lip of the pale yellow corolla ⅓ in. long.—Dewèvre in *Comptes-rendus Soc. Bot. Belg.* xxxiii. 105; Avetta in *Ann. Istit. Bot. Roma*, vi. 61. *Phlomis africana*, P. Beauv. *Fl. Owar.* ii. 82, t. 111.

Upper Guinea. Liberia: Cape Palmas, *Vogel*, 36! Senegal, *Leprieur, Perottet*. Togoland: Misaböhe, *Baumann*, 47! Interior of Western Lagos, *Rowland*! Guinea, *Thonning*. Niger Territory: Borgu; in the vicinity of towns, *Barter*, 1053!

Mozamb. Dist. British Central Africa: Nyasaland; Blantyre, *Descamps*.

Nile Land. Darfour, *Purdy*, 97! Nubia: between Korosko and Berber, *Kotschy*, 373! Cordofan: Kohn Mountain, *Kotschy*, 396! Eritrea; Bogos; Keren, *Steudner*, 1389! Galabat: region of Matamma, *Schweinfurth*, 139! Abyssinia; Tigre; near Jelajeranne, *Schimper*, 1793! Shoa; Valley of the torrent Saur e Giacca, *Antinori*; and without precise locality, *Schimper*, 178! *Quartin-Dillon & Petit*, 17! *Parkyns*! British East Africa: Bongo; Duggudu, *Schweinfurth*, ser. iii. 54!

2. **L. nepetæfolia**, *R. Br.; Benth. in DC. Prod.* xii. 535. An erect branched annual 4–5 ft. high, with stout finely pubescent stems. Leaves distinctly petioled, thin, ovate, crenate, nearly glabrous, the lower 3–4 in. long. Whorls very dense, 2–2½ in. diam.; bracts large, linear, rigid. Calyx-tube obscurely pubescent, at first ¼ in. long; upper tooth much the largest, lanceolate, like the others conspicuously mucronate. Corolla deep bright yellow, twice as long as the calyx; upper lip ⅓–½ in. long.—Briquet in *Bull. Soc. Bot. Belg.* xxxvii. 59; Henriques in *Bolet. Soc. Brot.* x. 150; Hiern in *Cat. Afr. Pl. Welw.* i. 879.

Upper Guinea. Sierra Leone: near Regent, in waste places, *Scott-Elliot*, 4000! Sherbro Island, *Garrett in Scott-Elliot Herb.* 5765! and without precise locality, *Vogel*, 94! Island of St. Thomas, *Moller*. Lagos, *Millen*.

Nile Land. British East Africa: Uganda, common on waste ground, *Wilson*, 57!

Lower Guinea. Lower Congo, *Hens, Dupuis*. Angola, *Welwitsch*, 5500, 5562, 5577, 5578.

South Central. Congo Free State: Mtowa, on Lake Tanganyika, *Descamps*.

Mozamb. Dist. Lake Tanganyika, *Cameron*! Kavala Islands in Lake Tanganyika, *Carson*, 32! Portuguese East Africa: Zambesi Delta; between Mambucha and Vicenti, *Scott*! Lower Zambesi; Tete, *Kirk*! Shupanga, *Stewart*! Rios de Sena, *Peters*; Inhambane, *Peters*; Kerimba Islands and elsewhere in Mozambique, *Peters*. British Central Africa: Nyasaland; Chibisa (Chikwawa) on the River Shire, *Meller*!

Cosmopolitan in the tropics.

3. **L. Melleri**, *Baker*. A perennial herb, with stout finely pubescent stems. Leaves petioled, ovate, crenate, green and shortly hairy above, densely clothed with whitish tomentum below. Whorls very dense, 2½ in. diam.; bracts minute. Calyx-tube hairy, ¼ in. long; teeth

with very conspicuous spiny tips, the upper much the longest ($\frac{1}{4}$ in. long). Corolla white; upper lip densely clothed with spreading white hairs.

Mozamb. Dist. British Central Africa: Nyasaland; Manganja Hills, 3000 ft., *Meller*! Mount Chiradzulu, 4000 ft., *Whyte*!

4. **L. Leonurus**, *R. Br.*; *Benth. in DC. Prod.* xii. 536. A branched perennial herb, with densely hairy stems. Leaves sessile, oblong-lanceolate or lanceolate, 3–4 in. long, $\frac{1}{2}$ –1 in. broad at the middle, obscurely crenate, narrowed to the base, pubescent on both surfaces. Whorls few, distant, subtended by large leaves; bracts linear-subulate, pungent, shorter than the calyx. Calyx $\frac{1}{2}$ in. long, pilose; tube long; teeth minute, deltoid. Corolla reddish-yellow, 18–21 lin. long, densely pilose; tube rather longer than the calyx; upper lip large; lower small. Stamens not exerted.

South Central. Congo Free State: Lunda; Lulua River, *Pogge*, 360 (var. *vestita*, *Briquet in Engl. Jahrb.* xix. 194).

Mozamb. Dist. British Central Africa: Urungu; Fwambo, 5000–6000 ft., *Carson*, 31 of 1894 collection! Kalangwizi River at Lake Moero, *Carson*, 19! Nyasaland; between Kondowe and Karonga, 2000–6000 ft., *Whyte*, 320.

Also in South Africa.

5. **L. velutina**, *Fenzl*; *Benth. in DC. Prod.* xii. 535. A tall-branched perennial herb, with stout finely hairy stems. Leaves distinctly petioled, ovate, crenate, very hairy beneath. Whorls very dense, 3 in. diam.; bracts small, linear. Calyx-tube very hairy, $\frac{1}{3}$ in. long; teeth deltoid, uppermost much the largest. Corolla deep bright yellow, 1 in. long; upper lip $\frac{1}{3}$ – $\frac{1}{2}$ in. long.—*Vatke in Linnæa*, xxxvii. 332; *Engl. Hochgeoirgsfl. Trop. Afr.* 371; *Dewèvre in Comptes-rendus Soc. Bot. Belg.* xxxiii. 105.

Nile Land. Ethiopia, *Kotschy*, 519! Abyssinia: Tigre; near Adowa, *Steudner*, 1384; Samen; Ghaba Valley, *Steudner*, 1388! Urahut District; Mount Erareta, 10,000 ft., *Schimper*, 758.

Mozamb. Dist. British Central Africa: Nyasaland; Blantyre, *Descamps*.

Var. *rugosa*, *Baker*. Calyx and leaves beneath glabrescent. *L. rugosa*, *Benth. in DC. Prod.* xii. 535; *A. Rich. Tent. Fl. Abyss.* ii. 201; *Schweinf. Beitr. Fl. Aethiop.* 123. *L. nepetaefolia*, *Hochst. in Schimp. Pl. Abyss. Exsicc.* No. 371.

Nile Land. Cordofan: near Obeid, *Cienkowsky*. Eritrea: Mount Bizen, 6500 ft., *Schweinfurth & Riva*, 2071! Sennar: near Roseres, *Cienkowsky*. Abyssinia: Tigre; near Gennia in the Memsach region, *Schimper*, 371! Hamedo Plain, 4600 ft., *Schimper*, 758 bis. Shire Province, *Quartin-Dillon & Petit*, 14! and without precise locality, *Schimper*, 37! British East Africa: Kikuyu; very common in Kidung Valley and near Lake Naivasha, 6000 ft., *Scott-Elliott*, 6503! Kapte Plateau, 5000–6000 ft., *Thomson*!

South Central. Congo Free State: Monbuttu; in the steppe near Kussumbo River, *Schweinfurth*, 3199!

6. **L. Elliotii**, *Baker*. A much-branched perennial herb 5–10 ft. high, with pubescent sulcate tetragonous stems. Leaves shortly petioled, ovate, the lower 2–3 in. long, crenate, greenish and slightly hairy above,

densely clothed with fine soft grey hairs beneath. Whorls solitary, globose, large, terminal; bracts large, linear-subulate, hairy. Calyx-tube funnel-shaped, slightly hairy, $\frac{1}{3}$ in. long; teeth very unequal, lanceolate-cuspidate, the uppermost the largest, nearly as long as the tube. Corolla bright orange yellow, twice as long as the calyx-tube; upper lip densely villous.

Nile Land. British East Africa: Mau Forest, 7000–8000 ft., *Scott-Elliot*, 6950!

7. **L. mollissima**, *Gürke in Engl. Jahrb.* xxii. 141. A perennial herb, with finely pubescent branches. Leaves distinctly petioled, ovate, the lower 3–4 in. long, subacute, cordate, crenate, thinly pubescent and green above, densely matted with soft white pubescence beneath. Whorls 2–3, dense, $2\frac{1}{2}$ in. diam.; pedicels very short; bracts small, subulate, mucronate. Calyx pubescent, $\frac{1}{2}$ in. long; teeth lanceolate-mucronate, the upper one much the largest. Corolla 1 in. long, very hairy, bright orange varying to pale yellow and pale red. Stamens included.

Lower Guinea. Angola; Humpata, *Newton*, 106.

Mozamb. Dist. German East Africa: Kilimanjaro; near Marangu, 4800 ft., *Volkens*, 235A! at 4000–5000 ft., *Johnston*! near Kilema Mission Station, 4800 ft., *Volkens*, 1688, lower margin of the forest, 6500 ft., *Meyer*, 111; Usambara; Kwa Mshuza, in openings in the forest, 4800 ft., *Holst*, 9075! in the bush on the lower hills of Mlalo, *Holst*, 387.

8. **L. decadonta**, *Gürke in Engl. Jahrb.* xxii. 144. A perennial herb, with pubescent or glabrescent stems. Leaves distinctly petioled, ovate-lanceolate, the lower 5–6 in. long, subacute, narrowed to the base, distinctly crenate, thinly pubescent above, densely pubescent beneath. Whorls 2–3, dense, globose, $2\frac{1}{2}$ –3 in. diam., subtended by reduced leaves; pedicels very short; bracts linear, densely pilose, $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Calyx $\frac{1}{2}$ in. long, glabrous towards the base, pilose upwards; teeth 10, equal, deltoid-cuspidate, $\frac{1}{6}$ in. long. Corolla bright orange, very hairy, 1 in. long. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; Manganja Hills, East of Banque Pass, 3000 ft., *Meller*! Shire Highlands, *Buchanan*, 78 of 1881 collection.

9. **L. dubia**, *E. Meyer; Benth. in DC. Prod.* xii. 536. Perennial. Stem erect, 3 ft. long, finely pubescent. Leaves long-petioled, cordate-ovate, the lower 3–4 in. long, crenate, green and glabrous above, finely pubescent beneath. Flowers in dense axillary whorls; pedicels very short; bracts minute. Calyx cylindrical, $\frac{3}{4}$ in. long; upper tooth deltoid, acuminate, $\frac{1}{6}$ in. long, the rest much smaller. Corolla twice as long as calyx, hairy, bright orange-red; upper lip lingulate, as long as the tube; lower lip small. Stamens as long as the upper lip.

Mozamb. Dist. British Central Africa: Nyasaland, *Mahon*! Flowered at Kew in September 1898.

Also in South Africa.

10. **L. Schinzii**, *Gürke in Engl. Jahrb.* xxii. 143. Stems branched, glabrous or pubescent. Leaves petioled, lanceolate, $1\frac{1}{2}$ –2 in. long, acute, deeply serrate, glabrous on both surfaces, the veins raised beneath. Bracts subulate, spinous. Calyx about $\frac{3}{4}$ in. long, entirely glabrous or pubescent upwards; teeth 8, deltoid, rigid, spinous, the upper longest. Corolla orange-yellow.

Lower Guinea. German South-west Africa: Hereroland; near Kurumanas, *Fleck*, 568; Great Namaqualand; Homeib, *Schinz*, 40.

39. **OTOSTEGIA**, Benth.; Benth. et Hook. f. *Gen. Plant.* ii. 1213.

Calyx-tube funnel-shaped, 10-ribbed; limb scarious, bilabiate; upper lip small, ovate; lower much broader, orbicular-cuneate, subentire or crenate. Corolla-tube included, with a ring of hairs inside; limb bilabiate; upper lip arcuate, densely hairy outside; lower deflexed, 3-lobed. Stamens 4, didynamous, arcuate; lower pair the longest; anther-cells divaricate. Disk equal. Style bifid at the apex; nucules ovoid, obtuse.—Shrubs or undershrubs. Leaves sessile or petioled, entire or crenate. Flowers few or many in laxly disposed leafy whorls bracts herbaceous or spinous.

Species about 10, the others inhabiting Arabia, North India and the Orient.

Leaves subsessile, entire.

Bracts with a pungent point	1. <i>O. integrifolia</i> .
Bracts without a pungent point	2. <i>O. Steudneri</i> .
Leaves subsessile, crenate	3. <i>O. tomentosa</i> .
Leaves distinctly petioled, crenate.	
Lower lip of calyx obscurely crenate	4. <i>O. scariosa</i> .
Lower lip of calyx distinctly crenate.	
Whorls many-flowered	5. <i>O. repanda</i> .
Whorls 2-flowered	6. <i>O. modesta</i> .

1. **O. integrifolia**, *Benth. in DC. Prod.* xii. 522. A much-branched shrub, with slender woody branches, clothed with fine white tomentum; nodes bearing a couple of large spreading spines from each side. Leaves nearly sessile, lanceolate, entire, 1–2 in. long, cuneate at the base, clothed on both sides with white tomentum. Whorls few or many, 5–6-flowered; bracts rigid, tricuspidate. Calyx sessile; tube $\frac{1}{4}$ in. long, densely pubescent, with 10 raised ribs; upper lip small, oblong, pointed, entire; lower orbicular-cuneate, $\frac{3}{4}$ in. broad, faintly crenate. Corolla reaching to the tip of the lower lip.—A *Rich. Tent. Fl. Abyss.* ii. 197; *Engl. Hochgebirgsfl. Trop. Afr.* 369. *Moluccella integrifolia*, R. Br. in *Salt, Abyss. Append.* 64.

Nile Land. Eritrea; Arrot Valley, 4200 ft., *Schweinfurth & Riva*, 675! environs of Acrur, 6100 ft., *Schweinfurth & Riva*, 1134! Abyssinia: Tigre; hills near Dungena Go, in the Memsach district, *Schimper*, 228! Samen; Ataba, *Steudner*, 1381! Shire Province, *Petit*! and without precise locality, *Schimper*, 789! 1850! *Quartin-Dillon & Petit*, 11!

2. **O. Steudneri**, *Schweinf. in Verh. Zool.-Bot. Gesell. Wien*, 1868, 682. A shrub, with slender woody spineless branches clothed with whitish tomentum. Leaves oblong-lanceolate or lanceolate, subsessile, entire, 1-1½ in. long, tomentose especially on the lower side. Flowers many in a whorl, sessile; bracts lanceolate, not spinous, half as long as the calyx. Calyx-tube densely pubescent, $\frac{1}{5}$ - $\frac{1}{2}$ in. long; limb with 7 distinct teeth and a produced orbicular lobe on the lower side. Corolla produced beyond the calyx-limb.—*Engl. Hochgebirgsfl. Trop. Afr.* 370.

Nile Land. Abyssinia: Samen; Ghaba Valley, 9700 ft., *Steudner*, 1398; and without precise locality, *Schimper*, 26!

3. **O. tomentosa**, *A. Rich. Tent. Fl. Abyss.* ii. 198. A shrub, with woody virgate pubescent branchlets, without any spines. Leaves shortly petioled, very small, thick, oblong, obtuse, crenate, white-tomentose beneath, with much-raised veins. Flowers few in a whorl, sessile; bracts not spinous. Calyx-tube, funnel-shaped, densely pubescent, $\frac{1}{3}$ in. long, with a small orbicular lobe on the lower side, and several crenations round the rest of the throat. Corolla not seen.—*Beck in Paulitschke, Harar*, 458.

Nile Land. Abyssinia: Province of Wojerat, *Petit!* Somaliland; near Harar, on Mount Haquin and at Lake Haramaja, *Hardegger & Paulitschke*.

4. **O. scariosa**, *Benth. in DC. Prod.* xii. 522. A shrub, with slender square pubescent branches, without any spines. Leaves thin, distinctly petioled, broadly ovate, conspicuously crenate, the largest 1 in. long, broadly cuneate and entire at the base, green and inconspicuously pubescent above, densely pubescent beneath. Whorls laxly disposed, subtended by fully-developed leaves; bracts many, subulate, not spinous. Calyx-tube densely pubescent, $\frac{1}{4}$ - $\frac{1}{3}$ in. long; upper lip small, ovate, entire; lower orbicular, obscurely crenate, $\frac{1}{3}$ in. broad. Corolla much protruded beyond the calyx-lip.—*A. Rich. Tent. Fl. Abyss.* ii. 198. *O. moluccoides*, *Jaub. & Spach; Boiss. Fl. Orient.* iv. 777. *Clinopodium fruticosum*, *Forsk. Fl. Ægypt.-Arab.* 107.

Nile Land. Abyssinia: Enderta district; in stony mountainous places, near Chelicut, *Quartin-Dillon & Petit*, 10! and without precise locality, *Salt*.

Also in Arabia and Midian.

5. **O. repanda**, *Benth. in DC. Prod.* xii. 522. A shrub, with pubescent branches, without any spines. Leaves distinctly petioled, ovate, crenate, 1-2 in. long, cuneate and entire at the base, green and obscurely pubescent above, densely pubescent beneath. Whorls numerous, many-flowered, subtended by fully-developed leaves; bracts many, subulate, not spinous. Calyx-tube pubescent, $\frac{1}{4}$ - $\frac{1}{3}$ in. long; upper lip very small, ovate; lower orbicular, crenate, $\frac{1}{3}$ in. broad. Corolla protruded beyond the lower lip of the calyx.—*A. Rich. Tent. Fl. Abyss.* ii. 198; *Engl. Hochgebirgsfl. Trop. Afr.* 370.

Nile Land. Nubia: Gebel Shellal, in the Soturba Mountains, *Schweinfurth*, 143! coast to between 3000 and 4000 ft., *Bent!* Eritrea: Arrot Valley, 4300 ft.,

Schweinfurth & Riva, 690! around Acrur, 6100 ft., *Schweinfurth & Riva*, 749! Keren, *Steudner*, 1395! Abyssinia: Tigre; lower part of Mount Kubbi, near Gennia, in the Memsach district, *Schimper*, 125! Shoa; Aliu Amba, *Roth*, 530 (187)! Ankober, *Roth*, 531! and without precise locality, *Quartin-Dillon & Petit*, 428! *Schimper*, 60! 1938! *Parkyns*! *Salt*.

Also in Arabia.

6. **O. modesta**, *S. Moore in Journ. Bot.* 1899, 65. Stem short, pale brown, tomentose when young, glabrescent. Leaves petioled, ovate, very small, obtuse, crenate or dentate, minutely pubescent above, tomentose beneath. Flowers solitary in the axils of the leaves; bracts spinous, very slender, $\frac{1}{8}$ in. long. Calyx-tube pubescent, narrowed to the base $\frac{1}{4}$ in. long; upper lip very short, with 3 triangular teeth; leaves $\frac{1}{5}$ in. long, undulated. Corolla twice the length of the calyx; limb as long as the tube.

Nile Land. British Somaliland; Waggar Mountains, *Mrs. Lort-Phillips*.

40. **TINNEA**, *Kotschy et Peyr.*; *Benth. et Hook. f. Gen. Plant.* ii. 1220.

Calyx campanulate, with two orbicular entire lips, very much enlarged and becoming bladderlike in a late stage and splitting down to the base into two lips. Corolla-tube broadly funnel-shaped, scarcely longer than the calyx; limb bilabiate; upper lip short, orbicular; lower longer, deflexed, 3-lobed. Stamens 4, didynamous, arcuate; anthers 2-celled; cells short, diverging, finally subconfluent. Disk equal. Ovary shortly 4-lobed; style bifid at the apex; upper branch very short. Nucules clavate, furnished with a broad membranous wing.—Shrubs or perennial herbs. Leaves sessile or petioled, usually entire. Whorls 2- or few-flowered, axillary or forming terminal panicles. Flowers small, brownish.

An African genus, chiefly tropical; one species in South Africa.

Branchlets not long and virgate.

Calyx very large and inflated.

Flowers in a terminal racemose panicle 1. *T. physaloides*.

Fruit axillary, solitary or sparsely cymose 2. *T. vesiculosa*.

Calyx smaller (finally $\frac{1}{3}$ — $\frac{1}{2}$ in. long).

Leaves linear 3. *T. filipes*.

Leaves oblong 4. *T. æthiopica*.

Leaves lanceolate or ovate-lanceolate 5. *T. gracilis*.

Leaves broadly ovate 6. *T. Fischeri*.

Leaves suborbicular 7. *T. platyphylla*.

Branchlets long and virgate.

Floral leaves large 8. *T. vestita*.

Floral leaves small.

Pedicels short.

Flowers in pairs from the axils of reduced leaves 9. *T. antiscorbutica*.

Flowers forming a terminal racemose panicle.

Bracts ovate, acute 10. *T. Barteri*.

Bracts orbicular or obovate 11. *T. eriocalyx*.

Pedicels as long as the flower-calyx 12. *T. zambesiaca*.

1. **T. physaloides**, *Baker in Kew Bulletin*, 1898, 163. A shrub, with slender woody densely pubescent branches. Leaves petioled, ovate, 2–3 in. long, acute, broadly rounded at the base, entire, subglabrous on the upper surface, pubescent beneath. Flowers in a terminal raceme; pedicels pubescent, 2–4 lin. long. Calyx at first oblong, membranous, pubescent, 7–8 lin. long, with two short rounded lips, finally vesicular, cordate-ovoid, 1–1¼ in. long. Corolla pubescent, 1 in. long. Stamens included.

Mozamb. Dist. British Central Africa: Nyasaland; Masuka Plateau, 6500–7000 ft., *Whyte*, 289!

2. **T. vesiculosa**, *Gürke in Engl. Jahrb.* xxii. 129. Stem and branches tomentose. Leaves shortly petioled, ovate, 2½–3 in. long, acuminate, rounded at the base, entire, pubescent on both surfaces. Flowers solitary or in 3–5-flowered cymes in the axils of the upper leaves; pedicels short, tomentose; bracts petioled, lanceolate, acuminate. Calyx pubescent, above ½ in. long in the flowering stage, very accrescent, finally vesicular. Corolla reddish-violet. Nucules lanceolate.—*Gürke in Engl. Jahrb.* xxviii. 466.

Mozamb. Dist. German East Africa: Ukami; near Nglewenu in the Uluguru Mountains, 4200 ft., *Stuhlmann*, 8843.

3. **T. filipes**, *Baker*. A shrub, with pubescent slender branchlets. Leaves sessile, linear, small, thick, rigid, obtuse, mucronate, finely pubescent. Inflorescence a lax terminal raceme, with 2 flowers in each whorl and with very slender pedicels reaching ½–½ in. long, subtended by very minute bracts. Flower-calyx ⅙ in. long, densely hairy. Corolla-tube hairy outside, longer than the calyx.

Mozamb. Dist. German East Africa: Livingstone Hills to Uluna, *Johnson*!

4. **T. æthiopica**, *Kotschy and Peyr. Plant. Tinn.* 25, t. 11. A much-branched shrub, 3–5 ft. high, with woody branchlets shortly hairy upwards. Leaves oblong, shortly petioled, usually entire, firm, glabrous or pubescent beneath, the upper, 1 in. or less long, the lower 1½–2 in. long, cuneate at the base. Whorls laxly dispersed, usually 2-flowered; bracts oblong, foliaceous, about as long as the flowers; pedicels filiform, ⅙–¼ in. long. Calyx finely pubescent, ¼–⅓ in. long in the flowering stage, with lobes nearly as long as the tube, finally nearly 1 in. long. Corolla dark purplish-brown; lower lip ⅙ in. long. Anthers glabrous. Wing of the fruit as broad as the clavate nucleus.—*Bot. Mag.* tt. 5637 and 6744; *Oliv. in Trans. Linn. Soc.* xxix. 139; *Britten in Gregory, Great Rift Valley*, 396; *Gürke in Engl. Jahrb.* xxviii. 466.

Nile Land. British East Africa: Jur; in the forest region towards Bongo, *Mdlle. Tinne*. Mittu; Mvolo, *Schweinfurth*, 2814! Unyoro, *Speke & Grant*! Madi; banks of Madi burn, *Speke & Grant*, 705! Nandi district; Nzowi River, *Scott-Elliot*, 6693! Ukamba; Kitui, *Hildebrandt*, 2857! Nyika country, near Mombasa, *Wakefield*! Mombasa, *Wakefield*! Mombasa Island, *Hildebrandt*, 1924! Mkonumbi, *Gregory*.

Mozamb. Dist. Zanzibar, *Kirk*! German East Africa: Kilimanjaro, 5000 ft., *Johnston*! Usambara; Masheua, *Holst*, 3495! Kwa Mshuza, *Holst*, 8967A! Usaramo

district, *Stuhlmann*, 6638! British Central Africa: Nyasaland; between the River Songwe and Karonga, 1700–2000 ft., *Whyte*! Masuka Plateau, 6500–7000 ft., *Whyte*! Tanganyika Plateau, at Fort Hill, 3500–4000 ft., *Whyte*!

5. **T. gracilis**, *Gürke in Engl. Jahrb.* xxii. 128. A shrub, with pubescent branches. Leaves subsessile or very shortly petioled, lanceolate or ovate-lanceolate, $\frac{1}{3}$ – $\frac{1}{2}$ in. long, obtuse, narrowed to the base, entire, coriaceous, pubescent on both surfaces. Flowers 1–3-nate in the axils of the upper leaves; pedicels long. Calyx coriaceous, pubescent, finally $\frac{1}{2}$ in. long. Nucules narrowly obovoid, with an oblong basal areole.

Mozamb. Dist. German East Africa: Unyamwezi; near Muhulalo, *Stuhlmann*, 464.

6. **T. Fischeri**, *Gürke in Engl. Jahrb.* xxii. 128. A shrub, with pubescent branches. Leaves long-petioled, broadly ovate, about 1 in. long, narrowed or rounded to the base, deeply crenate, glabrous on both surfaces. Flowers solitary in the axils of the upper leaves on long pedicels. Calyx pubescent, not seen fully developed.

Mozamb. Dist. East Africa: without precise locality, *Fischer*, i. 175.

7. **T. platyphylla**, *Briquet in Engl. Jahrb.* xix. 194. A shrub, with robust tomentose branches. Leaves suborbicular, mucronate, cordate, above 2 in. long and broad, entire, rather thick, sessile or subsessile, green and pubescent above, clothed with grey down beneath. Racemes 6 in. long; pedicels $\frac{1}{2}$ in. long; bracts suborbicular, much imbricate, $\frac{1}{3}$ – $\frac{2}{3}$ in. long. Calyx downy, finally $\frac{1}{2}$ in. long; tube short, campanulate; limb deeply bilabiate. Corolla $\frac{1}{8}$ – $\frac{1}{6}$ in. longer than the calyx.

South Central. Congo Free State: Lunda; Mussumba, *Pogge*, 346.

8. **T. vestita**, *Baker*. An undershrub, with slender straight densely tomentose branchlets. Leaves opposite, sessile, orbicular, entire, minutely mucronate, densely matted with thin whitish tomentum on both sides, the lower 1 in. long. Flowers in pairs from the axils of fully-developed leaves, on short pedicels. Calyx densely pubescent, $\frac{1}{3}$ in. long in the flowering stage; lobes orbicular, very short. Corolla-tube not longer than the calyx; lower lip of the corolla nearly $\frac{1}{2}$ in. broad. Anthers glabrous.

Mozamb. Dist. British Central Africa: Rhodesia; Leshumo Valley, *Holub*, 716! 717! 718! 719!

9. **T. antiscorbutica**, *Welw. in Trans. Linn. Soc.* xxvii. 58. An undershrub, with long virgate densely pubescent branches. Leaves 2–3-nate, sessile, ovate, entire, strongly mucronate, broadly rounded at the base, moderately firm, scabrous above, pubescent beneath, 1–2 in. long. Flowers produced in pairs from the axils of reduced orbicular mucronate leaves $\frac{1}{4}$ – $\frac{1}{2}$ in. long; pedicels short. Flower-calyx globose,

densely pubescent, $\frac{1}{4}$ – $\frac{1}{3}$ in. long and broad; fruit calyx $\frac{3}{4}$ in. long. Corolla brownish, twice as long as the calyx; lower lip large.—Hiern in Cat. Afr. Pl. Welw. i. 879.

Lower Guinea. Angola: province of Golungo Alto, 1090–2400 ft., *Welwitsch*, 1631! 1632!

Mozamb. Dist. German East Africa: Ubena district north of Lake Nyasa, *Johnson!* and without precise locality, *Hannington!*

10. **T. Barteri**, *Gürke in Engl. Jahrb.* xxviii. p. 314. An undershrub 4 ft. high, with long straight pubescent virgate branches. Leaves 2–3-nate, nearly sessile, orbicular or oblong, obtuse, minutely mucronate, firm, densely pubescent on both sides, the lower 1 in. long. Inflorescence a long raceme, dense in the upper, lax in the lower part; bracts small, ovate, acute, pubescent; pedicels short, stout. Calyx in the flowering stage $\frac{1}{4}$ – $\frac{1}{3}$ in. long, densely pubescent; finally about $\frac{1}{2}$ in. long, split down to the base. Corolla-tube pubescent, rather longer than the calyx. Anthers glabrous. Nucules, including the broad wing, $\frac{1}{4}$ in. broad.

Upper Guinea. Niger Territory: Nupe; on the sides of hills, *Barter*, 971! 1261!

11. **T. eriocalyx**, *Welw. in Trans. Linn. Soc.* xxvii. 59. An undershrub, with long slender erect virgate densely hairy branches. Leaves 2–3-nate, nearly sessile, oblong or the lowest orbicular, moderately firm, entire, minutely mucronate, 1–1 $\frac{1}{2}$ in. long, green and glabrous above, obscurely pubescent beneath. Flowers in a terminal raceme, dense upwards, lax downwards; pedicels short; upper bract orbicular, as long as the flower-calyx. Flower-calyx orbicular, densely woolly, $\frac{1}{3}$ in. long and broad. Corolla-tube scarcely longer than the calyx; lower lip $\frac{1}{3}$ in. broad.—*Engl. Hochgebirgsfl. Trop. Afr.* 371; Hiern in Cat. Afr. Pl. Welw. i. 880.

Lower Guinea. Angola: Province of Huilla, 5000 ft., *Welwitsch*, 1635!

12. **T. zambesiaca**, *Baker*. An undershrub, with long slender virgate branchlets, densely hairy upwards. Leaves 2–4-nate, shortly petioled, oblong or ovate, acute, nearly glabrous above, obscurely pubescent beneath, the lower 2–3 in. long, the upper growing gradually smaller. Flowers 2–4-nate, in a long terminal raceme; pedicels $\frac{1}{4}$ in. long, often bracteolate; bracts ovate, acute, foliaceous, $\frac{1}{4}$ – $\frac{1}{2}$ in. long. Calyx densely pubescent, $\frac{1}{4}$ – $\frac{1}{3}$ in. long in the flowering stage; lips half as long as the tube; fruit-calyx very large and bladder-like. Corolla and stamens as in *T. ethiopica*. Nucules, including the wing, $\frac{1}{3}$ – $\frac{1}{2}$ in. long and broad.

Mozamb. Dist. German East Africa: Zanguebar, *Kirk*, 58! British Central Africa: Northern Zambesia; Batoka Highlands, near Victoria Falls, *Kirk!* Nyasaland; between Missale and Loangwe River, *Nicholson!* opposite Chibisa (Chikwawa), on the River Shire, 400 ft., *Kirk!* Blantyre, *Buchanan*, 65! Shire Highlands, *Buchanan*, 495! and without precise locality, *Buchanan*, 518!

41. **RENSCHIA**, Vatke in *Linnaea*, xliii. 94.

Calyx campanulate, with two entire orbicular lips, small in the flowering stage, in fruit much enlarged, finally splitting down to the base into two entire lobes. Corolla-tube narrowly funnel-shaped, three times the length of the calyx; limb bilabiate; upper lip orbicular; lower lip longer, deflexed, 3-lobed. Stamens 4, didynamous, arcuate; lower pair the longest; anther-cells short, divaricate. Disk equal. Nucules 4, clavate, triquetrous on the inner face, basally attached to a small aureole. Style bifid, the upper fork very short. Fruit unknown.

Endemic and monotypic.

1. **R. heterotypica**, *Vatke in Linnaea*, xliii. 94. A much-branched undershrub, $1\frac{1}{2}$ –2 ft. high, with pale slender woody branchlets, finely pubescent upwards. Leaves ovate, obtuse, irregularly crenate, glabrous, the lower 1 – $1\frac{1}{4}$ in. long and broad, truncate at the base; petiole nearly as long as the blade. Inflorescence a long terminal raceme; pedicels short; bracts linear, as long as the pedicels. Flower-calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. long, pubescent. Corolla purple; tube $\frac{1}{3}$ in. long; lower lip $\frac{1}{12}$ in. long. Stamens all four slightly protruded beyond the upper lip of the corolla. —*Tinnea heterotypica*, S. Moore in *Journ. Bot.* 1877, 69, t. 185, fig. 3.

Nile Land. British Somaliland: Ahl Mountains, near Maid, 4500 ft., *Hildebrandt*, 1429!

42. **TEUCRIUM**, Linn.; Benth. et Hook. f. *Gen. Plant.* ii. 1221.

Calyx-tube funnel-shaped or campanulate, rarely inflated; teeth 5, subequal or the uppermost largest. Corolla-tube usually not longer than the calyx; limb bilabiate; upper lip very short; lower longer, deflexed, 3-lobed. Stamens 4, didynamous; lower pair longest; anther-cells divaricate, confluent. Disk equal. Style subequally forked at the tip. Nucules obovoid, rugose.—Herbs or undershrubs of very various habit. Leaves entire or crenate, those that subtend the flowers either large and foliaceous, or reduced to small bracts. Whorls usually 2-flowered, axillary or forming terminal racemes or heads.

Species about 100. Cosmopolitan; concentrated in the Mediterranean region.

Flowers in axillary whorls all down the stem . . . 1. *T. Scordium*.

Flowers condensed into globose terminal heads . . . 2. *T. Polium*.

1. **T. Scordium**, Linn.; Benth. in *DC. Prod.* xii. 586. A perennial herb, with simple or branched hairy ascending or spreading stems. Leaves in many pairs, sessile, oblong, obtuse, crenate, $\frac{1}{2}$ – $1\frac{1}{2}$ in. long, hairy or nearly glabrous. Flowers in pairs from the axils of large leaves all the way down the stem; pedicels as long as the calyx. Calyx $\frac{1}{8}$ in. long; teeth ovate, equal, as long as the campanulate tube. Corolla red, $\frac{1}{3}$ in. long.—A. Rich. *Tent. Fl. Abyss.* ii. 202; *Engl. Hoch-*

gebirgsfl. Trop. Afr. 371; *T. abyssinicum*, Hochst. ex Benth. in DC. Prod. xii. 586.

Nile Land. Abyssinia: Province of Urahut, in damp meadows, *Schimper*, 1766! and without precise locality, *Quartin-Dillon & Petit*, 188ter!

Also in Europe and Western Asia to the Himalaya.

2. **T. Polium**, *Linn.*; *Benth. in DC. Prod.* xii. 591. A perennial herb, densely branched from the crown of the root, with wiry stems densely clothed with white tomentum. Leaves crowded, sessile, small, oblong, with crispate-crenate revolute edges. Flowers aggregated in dense globose terminal heads; bracts small. Calyx densely villous, $\frac{1}{8}$ in. long; teeth small, ovate. Corolla twice as long as the calyx.—*Vatke in Linnæa*, xliii. 99.

Nile Land. Somaliland; Serrut Mountains, near Maid, 5800 ft., *Hildebrandt*, 1450! Adda Galla, *James & Thrupp*!

Also in South Europe, North Africa and Western Asia.

43. **AJUGA**, *Linn.*; *Benth. et Hook. f. Gen. Plant.* ii. 1222.

Calyx-tube campanulate, 10-ribbed; teeth 5, equal. Corolla-tube included or exserted; limb bilabiate; upper lip very short; lower longer, 3-lobed, deflexed. Stamens 4, didynamous, arcuate, usually protruding beyond the upper lip of the corolla; lower pair longest; anther-cells divergent, finally confluent. Disk equal or oblique. Ovary shortly 4-lobed; style subequally forked at the tip. Nucules obovoid, reticulated, obliquely attached.—Annual or perennial herbs, often stoloniferous. Leaves usually crenate. Whorls 2- or many-flowered, axillary or forming terminal racemes bracteate by much reduced leaves.

Species about 30, concentrated in the extra-tropical regions of the Old World.

1. **A. bracteosa**, *Wall. Cat. No.* 2032. A perennial herb, not stoloniferous, much branched at the base, with ascending hairy stems, 3-12 in. long. Leaves usually in many pairs, the upper obovate-oblong, obtuse, sessile, entire or crenate, slightly hairy, the lower oblong, with a cuneate base and obscure petiole. Whorls many-flowered, produced from the axils of the leaves all the way down the stem; pedicels short, hairy. Calyx $\frac{1}{6}$ in. long; teeth ovate-lanceolate, as long as the tube. Corolla blue, twice as long as the calyx-tube, straight, slender.—*Benth. in Wall. Pl. As. Rar.* i. 59; *Engl. Hochgebirgsfl. Trop. Afr.* 371; *Gürke in Engl. Pfl. Ost-Afr. C.* 342; *Britten in Gregory, Great Rift Valley*, 396. *A. remota*, *Benth. in Wall. Cat. No.* 2033, in *Wall. Pl. As. Rar.* i. 59, and in *DC. Prod.* xii. 597; *A. Rich. Tent. Fl. Abyss.* ii. 203; *Schweinf. Beitr. Fl. Aethiop.* 121.

Var. *crenata*, *Baker*. Stem and leaves more hairy. Leaves more crenate.—*A. crenata*, *Hochst. ex Benth. in DC. Prod.* xii. 597. *A. remota*, var. *canescens*, *Benth. l.c.*

Nile Land. Eritrea: Marakhat Valley, near Saganaiti, 6800-7100 ft., *Schweinfurth & Riva*, 834! Abyssinia: Tigre; Adowa, *Schimper*, 325. Debra Sina, near

Adowa, *Quartin-Dillon*; Maigouagoua, *Quartin-Dillon*; Samen; Debra Eski, 9700 ft., *Schimper*, 68. Shcata, *Schimper*, 545. Lotho, 8400 ft., *Schimper*, 483. Katz, 7900 ft., *Rohlf's & Stecker*. British East Africa: Machakos to Kikuyu, 5000–6000 ft., *Scott-Elliott*, 6584! Ukamba, 5000–6000 ft., *Scott-Elliott*, 6420! Maboko Mountains, in the sand of a dry river, *Scott-Elliott*, 6549! Leikipia; Guaso Laschau *Gregory*, Marungu and Steppes of Kiroruma (Kiloluma), *Gregory*.

Mozamb. Dist. German East Africa: Kilimanjaro; at Marangu, 4600 ft. *Volkens*, 224! above Marangu, 8700 ft., *Volkens*, 1159! Usambara, *Holst*.

Also in Arabia, Himalaya, China and Japan.

ORDER CIII. **PLANTAGINEÆ** (by J. G. Baker).

Flowers regular, usually hermaphrodite. Calyx inferior, 4-partite; sepals distinct, much imbricate. Corolla hypogynous, gamopetalous, scarious, marcescent; tube ampulliform or cylindrical; lobes 4, equal, spreading. Stamens inserted in the corolla-tube, usually 4; filaments filiform; anthers versatile, 2-celled, dehiscent by a long slit, ovary superior, 2-celled or spuriously 3–4-celled; ovules 1 to several in a cell; style filiform, entire. Fruit capsular, dehiscent or indehiscent. Seeds attached to the placenta by their inner face; albumen fleshy; embryo usually straight, parallel with the hilum; radicle short, inferior.—Perennial or annual herbs, acaulescent or caulescent. Flowers small, spicate, each subtended by a persistent bract.

Species over 200. Cosmopolitan, mainly in the temperate and subtemperate regions.

1. **PLANTAGO**, Linn.; Benth. et Hook. f. *Gen. Plant.* ii. 1224.

Flowers hermaphrodite or polygamo-dioecious. Calyx-segments 4, subequal, or 2 outer larger. Corolla-tube cylindrical or ampulliform; lobes 4, spreading horizontally. Stamens 4, inserted in the corolla-tube; filaments filiform; anthers versatile. Ovary usually 2-celled, with 1 to several ovules in each cell. Capsule membranous, circumscissile at the middle or the base. Seeds 2 to several, cymbiform, with a ventral hilum; albumen fleshy; embryo straight or curved; radicle inferior.—Annual or perennial herbs, often acaulescent, with the leaves in a radical rosette. Leaves very various, usually entire. Flowers inconspicuous, spicate or capitate, each subtended by a single bract.

Species 200. Cosmopolitan.

Seeds 4–8 in a cell 1. *P. major*.

Seeds 1 in a cell.

Acaulescent.

Spikes short, dense, oblong 2. *P. lanceolata*.

Spikes long, cylindrical.

Leaves sessile, linear, entire 3. *P. albicans*.

Leaves petioled, ovate.

Leaves toothed 4. *P. Fischeri*.

Leaves lobed 5. *P. palmata*.

Caulescent.

- Stem glandular pubescent 6. *P. Psyllium*.
 Stem glabrous except at the top 7. *P. stricta*.

1. **P. major**, *Linn.*; *Decne. in DC. Prod.* xiii. 694. Perennial, acaulescent. Leaves several in a radical rosette, ovate, narrowed into a channelled petiole, 5-7-nerved, glabrous or slightly hairy. Peduncle long, terete. Spike cylindrical, 4-6 in. long; bracts ovate-oblong, glabrous, as long as the calyx. Sepals oblong, glabrous, $\frac{1}{2}$ in. long. Corolla-lobes small, ovate. Stamens short. Capsule ovoid, as long as the calyx. Seeds 4-8 in a cell, angled by pressure.—*A. Rich. Tent. Fl. Abyss.* ii. 206; *Engl. Hochgebirgsfl. Trop. Afr.* 395; *Hiern in Cat. Afr. Pl. Welw.* i. 881.

Nile Land. Abyssinia: Tigre; near Adowa, 7400 ft., *Quartin-Dillon, Schimper*, 970; Begemeder (?) at Addi Shoa, 7400 ft., *Schimper*, 485!

Lower Guinea. Angola: Golungo Alto; in fields around Sange, 1000-2400 ft., *Welwitsch*, 513, 514!

Native of the North Temperate zone of the Old World, now widely diffused.

2. **P. lanceolata**, *Linn.*; *Decne. in DC. Prod.* xiii. 714. Perennial, acaulescent. Leaves lanceolate, narrowed gradually to the sessile base or to a short petiole. Peduncle long, slender, furrowed. Heads very dense, globose or oblong; bracts ovate, acute, as long as the calyx. Sepals oblong, obtuse, the outer often hairy. Corolla-lobes ovate, acute. Stamens and style long. Capsule 2-seeded.—*A. Rich. Tent. Fl. Abyss.* ii. 206; *Engl. Hochgebirgsfl. Trop. Afr.* 395. *P. abyssinica*, *Hochst. ex A. Br. in Flora*, 1841, i. 279.

Nile Land. Nubia: coast-land to between 3000-4000 ft., at about 21° N. lat., *Bent!* Eritrea: Hamasen district, *Steudner*, 1282; Degerra Valley, near Saganeiti, 7000 ft., *Schweinfurth & Riva*, 1248! Teramne; Godofelassi and Sassidolosatscha, *Rohlf's & Stecker*. Abyssinia: Tigre; in fields near Adowa, *Quartin-Dillon, Schimper*, 143! Hamedo Plain, *Schimper*, 138; Samen; Debra Eski, 9700 ft., *Schimper*, 91, Ataba, *Steudner*, 1274; Dembea; Gondar, *Steudner*, 1275; Shoa: Let-Marefia, *Ragazzi*.

Lower Guinea. Gaboon: Munda; Sibange Farm, *Soyaux*, 384!

Native of the North Temperate zone of the Old World, now widely diffused. The Abyssinian plant represents the var. *capitata* of Decaisne.

3. **P. albicans**, *Linn.*; *Decne. in DC. Prod.* xiii. 705. Perennial, acaulescent, densely tufted. Leaves sessile, linear, hairy, 1-6 in. long, obscurely 3-nerved. Peduncle elongated, more or less hairy. Spike long, cylindrical; bracts ovate, glabrous, as long as the calyx. Sepals $\frac{1}{2}$ in. long, oblong, obtuse, hairy. Corolla-lobes small, ovate. Stamens short. Capsule 2-seeded.—*Engl. Hochgebirgsfl. Trop. Afr.* 395.

Nile Land. Eritrea: around Saganeiti, 7100 ft., *Schweinfurth & Riva*, 800! Abyssinia: Serriro, 7100 ft., *Schimper*, 744! Geat, *Schimper*, 749! British Somaliland: without precise locality, *Miss Edith Cole! Mrs. Lort-Phillips!*

Spread through the Mediterranean region.

4. **P. Fischeri**, *Engl. Bot. Jahrb.* xix. *Beibl.* No. 47, 48. An acaulescent perennial herb. Leaves shortly petioled, broadly ovate, 2–3 in. long, firm, deeply dentate, turning black in drying, truncate or slightly cordate at the base, 7-nerved from the base, glabrous on both surfaces. Peduncles long, slender, many to a rosette. Spikes long, cylindrical, 3–4 in. long; bracts ovate, shorter than the flowers, with a firm centre and broad white scarious margin. Sepals oblong, obtuse, with a firm keel and broad scarious margin. Corolla-tube as long as the calyx; lobes ovate, acute. Stamens much exserted. Capsule ovoid, as long as the calyx, 2-seeded.

Nile Land. British East Africa: Aboi, *Fischer*, 512.

Mozamb. Dist. German East Africa: Kilimanjaro: Mawenzi Peak, 8700 ft., *Volkens*, 948. Lumi Ravine, 8700 ft., *Volkens*, 1901!

5. **P. palmata**, *Hook. f. in Journ. Linn. Soc.* vi. 19; vii. 213. Perennial, acaulescent. Leaves suborbicular, cordate, thin, finely hairy, shallowly, obtusely and irregularly palmately lobed; petiole very long and slender. Peduncle very long. Spike dense, cylindrical, 1–5 in. long; bracts ovate, glabrous, about as long as the calyx. Sepals oblong, obtuse, glabrous, $\frac{1}{2}$ in. long, with a brown keel and broad white margin. Corolla-lobes lanceolate, acute, nearly as long as the tube. Stamens short. Capsule ovoid, little longer than the calyx. Seeds 2, cymbiform.—*Engl. Hochgebirgsfl. Trop. Afr.* 395; *Aschers. Bot. Ost-Afr.* 74, t. 4. *P. Kerstenii*, *Aschers. in Sitzb. Gesell. Naturf. Fr. Berl.* 1868, 23.

Upper Guinea. Cameroons: Cameroon Mountain, 7000 ft., *Mann*, 1962! Fernando Po: Clarence Peak, 7500–8000 ft., *Mann*, 611!

Nile Land. Abyssinia: Begemeder: at Edda Jesus, near Debra Tabor, 9700 ft., *Schimper*, 1233! British East Africa: Mau, 7000–8000 ft., *Scott-Elliott*, 6826!

Mozamb. Dist. German East Africa: Kilimanjaro, 7000 ft., in marshy places, *Johnston*, 173! *Kersten!* and without precise locality, *Hannington!*

6. **P. Psyllium**, *Linn.*; *Decne. in DC. Prod.* xiii. 734. Annual, caulescent, $\frac{1}{2}$ –1 ft. high. Stems finely glandular-pubescent. Leaves sessile or verticillate from the nodes of the stem, narrowly linear. Heads many to a stem, dense, globose, on ascending peduncles; bracts ovate, glandular-pubescent, the lower rather longer than the calyx. Sepals oblong, $\frac{1}{8}$ in. long. Corolla-tube ampulliform, longer than the calyx; lobes very small, ovate. Stamens short. Capsule 2-seeded.—*A. Rich. Tent. Fl. Abyss.* ii. 207.

Nile Land. Abyssinia: Tigre; near Adowa, *Quartin-Dillon*; and without precise locality, *Schimper*, 977!

Spread through the Mediterranean region eastward to India.

7. **P. stricta**, *Schousb.*; *Decne. in DC. Prod.* xii. 735. Annual, caulescent, $\frac{1}{2}$ –1 ft. high. Stems glabrous in the lower part, slightly pubescent upwards. Leaves opposite or whorled from the nodes of the

stem, narrowly linear. Heads many to a stem, globose, on ascending peduncles; bracts ovate, the lower very acute, longer than the calyx. Sepals oblong, $\frac{1}{8}$ in. long. Calyx-lobes very small, ovate. Stamens short. Capsule 2-seeded.—Engl. Hochgebirgsfl. Trop. Afr. 396; Schweinf. Beitr. Fl. Aethiop. 164. *P. rugosa*, Hochst. ex Decne. in DC. Prod. xiii. 735.

Nile Land. Nubia: coast-land to between 3000 and 4000 ft., about 21° N. lat., *Bent!* between Atbara and the Red Sea, *Schweinfurth*, 1344! Abyssinia: Tigre; near Adowa, *Schimper*, 60! Abba Gerima, near Adowa, *Schimper*, 76; Samen; Debra Eski, 9700 ft., *Schimper*, 87; Lotho, 8400 ft., *Schimper*, 414.

Also in the Orient and North Africa. Scarcely more than a variety of *P. Psyllium*.

A D D E N D A.

1A. **GILLETIELLA**, De Wild. et Durand in *Comptes-rendus Soc. Bot. Belg.* xxxix. 71.

Corolla-tube broadening upwards, gibbous below, curved; lobes 5, spreading. Stamens 4, included, affixed to the tube of the corolla above the middle; filaments short; anthers linear, glandular-pilose, bearded at the base; lobes parallel, unequal at the base. Disk annular, interrupted. Ovary 2-celled; ovules 2 in each cell and superposed or solitary, erect; stigma with two nearly equal lobes; style flattened. Fruit drupaceous, 2-celled, 2-seeded, globular.—A climbing shrub, glabrous in all its parts. Leaves entire. Flowers axillary, solitary, with two large bracteoles which adhere together before flowering and at flowering become more or less free to the base.

1. **G. congolana**, *De Wild. et Durand in Comptes-rendus Soc. Bot. Belg.* xxxix. 72. Leaves obovate, petiolate, narrowed rather abruptly towards the almost hastate-cordate base, acute at the apex, 6–8 in. long, 2–4½ in. broad; petiole about 2 in. long. Peduncle more than 2 in. long; bracteoles acute, stated to be “ovate, $\frac{3}{4}$ –1 in. long and $\frac{3}{4}$ –1¼ in. broad,” and “to enclose the corolla-tube, which is about 7 lin. long, to the middle” (the dimensions seem incorrect). Corolla-lobes about $\frac{3}{4}$ in. long. Stamens with filaments only 1 lin. long; anthers 2½ lin. long. Style about 8 lin. long. Fruit described as 3 in. in diameter and nearly 2¼ in. in length, grooved at the middle, with the remains of the style above.

Lower Guinea. Congo Free State: Kisantu, on the Inkissi River, *Gillet*.

The meaning of the phrase “annularibus calycis brevissimis,” used of the calyx, is not clear.

6a. **Thunbergia Thonneri**, *De Wild. et Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 41. A climbing shrub, 10 ft. high. Stems at first sparsely pubescent, soon glabrescent. Leaves ovate, acuminate, acute below, 2½–6½ in. long, 1–2½ in. broad, slightly crisped and toothed at the margin, glabrous, on short petioles. Flowers solitary; peduncles $\frac{3}{4}$ –1¼ in. long; bracteoles ovate, represented as shortly acuminate in the figure cited below, but said to be long acuminate in the descriptions, glabrous except near the apex within, 1¼ in. long, $\frac{1}{2}$ in.

broad. Calyx-lobes long, narrow, with hairs or small scales. Corolla-tube yellow, long, nearly straight, sparingly hairy outside; lobes violet. Anther-lobes very unequal, with a bristly crest below, mucronate above. Stigma 2-lipped, drawn in the figure as cleft almost to the base, described as unequally bilobed and infundibuliform.—De Wild. & Durand, *Plant. Thonner. Congol.* 38, t. viii.

South Central. Congo Free State: Bobi, near Gali, north of the River Congo, *Thonner*.

The descriptions and the figure disagree; if the former are correct the plant is *T. affinis*, S. Moore.

6b. **Thunbergia liebrechtsiana**, *De Wild. et Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 132. A climbing shrub. Leaves ovate, rounded at the base, acute or shortly apiculate at the apex, glabrous, shining above, $2-3\frac{1}{4}$ in. long, $1-1\frac{1}{2}$ in. broad; petiole 2 lin. long. Flowers two together on leafy branches; peduncle $1\frac{1}{4}$ in. long; bracteoles ovate-acute, membranous, rosy-white, $\frac{3}{4}$ in. long, 5 lin. broad, caducous. Calyx-teeth unequal, linear-subulate, acuminate, at least the longer, 5 lin. long, with white scales. Corolla-tube recurved, pilose, pale yellow without, deep yellow within, $1\frac{1}{2}$ in. long; lobes violet, $\frac{3}{4}$ in. long. Anther-lobes unequal, pilose, with a bristly crest below. Stigma 2-lipped.

South Central. Congo Free State: Bangala, on the River Congo, *Dewèvre*. Apparently little more than a variety of *T. affinis*, S. Moore.

13a. **Thunbergia laborans**, *Burkill*. A low herb, burnt down by grass-fires. Stems when old $\frac{1}{2}$ lin. thick; young stems softly hairy, not quadrangular. Leaves on very short petioles, ovate-elliptic, rounded below, obtuse or somewhat rounded above, entire, somewhat pubescent on both surfaces, $\frac{1}{2}-\frac{3}{4}$ in. long, 4 lin. broad; petioles $\frac{1}{2}$ lin. long. Flowers on long peduncles; bracteoles ovate, acute, pilose-pubescent chiefly without, keeled, at flowering 6–7 lin. long and $2\frac{1}{2}-3$ lin. broad. Calyx-teeth at flowering $\frac{1}{3}$ lin. long, densely pubescent; tube $\frac{1}{4}$ lin. long. Corolla-tube 6–7 lin. long, widening considerably upwards; lobes $2\frac{1}{2}-3$ lin. long. Anthers shortly mucronate above, the posterior pair each with one curved spur, the anterior pair each with two curved spurs at the base; the margins fringed with hairs. Stigma 2-lipped; the upper lip inrolled, exceeding the lower, which is rounded-deltoid. Capsule when ripe $\frac{3}{4}$ in. long, pubescent, the beak $\frac{1}{2}$ in. long. Seeds covered with rows of spines, the lateral being a little flattened.

Mozamb. Dist. German East Africa: Urundi, 4000–5000 ft., *Scott-Elliot*, 8371!

20a. **Thunbergia Delamerei**, *S. Moore in Journ. Bot.* 1900, 205. Stems moderately thin, rampant, with reflexed hairs. Leaves ovate-hastate, obtuse, dentate-lobulate, membranous, pubescent, small, 5–8 lin. long, at the base 8 lin. broad; veins prominent below; petiole $2-3\frac{1}{2}$ lin. long, narrowly winged, pubescent. Flowers on peduncles $1\frac{1}{4}-1\frac{1}{2}$ in. long, conspicuously exceeding the leaves; bracteoles short, oblong, very

obtuse, pubescent, 8 lin. long, 3-4 lin. broad. Calyx-teeth linear-subulate, pubescent, $1\frac{1}{2}$ lin. long. Corolla-tube almost 1 in. long, purple; limb about 1 in. in diam., apparently yellow. Anthers rather villous, those of the upper pair with one spur at the base, those of the lower with two spurs. Stigma 2-lipped, the upper lip slightly smaller than the lower.

Nile Land. British East Africa, near Lake Marsabit, *Lord Delamere!*

27a. **Thunbergia Randii**, *S. Moore in Journ. Bot.* 1900, 201. Stem pubescent or puberulous. Leaves almost sessile, linear-oblong or almost linear and shortly hastate, obtuse at the apex, pilose-pubescent, $1\frac{1}{4}$ - $2\frac{1}{4}$ in. long, 3-7 lin. broad; petiole 1 lin. long, pubescent. Flowers on peduncles 7 lin. long; bracteoles ovate-lanceolate, acuminate, shortly and crisply pubescent. Calyx-teeth setaceous, rather hirsute. Corolla-tube narrow, white (?); limb $\frac{3}{4}$ in. in diam. Anthers obtuse at the apex, spurred below, pubescent. Stigma 2-lipped, the lips subequal. Capsule 8 lin. long, pubescent. Seeds compressed, nearly 2 lin. in diam., covered with scale-like outgrowths.

Mozamb. Dist. British Central Africa: Rhodesia; Buluwayo, *Rand*, 275! 276!

Differs from *T. kirkiana*, T. Anders., in its elongated leaves, short petioles, and shorter peduncles.

47. **Thunbergia oblongifolia**, *Oliv.* Add:—

Var. *Berringtonii*, Burkill. Leaves linear-lanceolate, very acute. Hairs on the plant confined to the neighbourhood of the nodes.

Mozamb. Dist. British Central Africa: Mashonaland, *Berrington!*

55. **Thunbergia lamellata**, *Hiern in Cat. Afr. Pl. Welw.* i. 803. Stems about 1 ft. high, several from the root, rather conspicuously striate, sulcate when dry, without hairs. Leaves sub-erect, sessile, broadly linear or linear-sublanceolate, narrowed to both ends, obtuse, with a minute mucro at the apex, and with equally minute teeth scattered along the margins, glabrous but almost scabrid, $1\frac{1}{8}$ - $3\frac{1}{2}$ in. long, $\frac{1}{8}$ - $\frac{3}{8}$ in. broad; 2 lateral nerves arise from the costa near the base and run for $\frac{3}{4}$ the length of the blade, other lateral nerves inconspicuous. Flowers solitary or in pairs at the nodes; peduncle $\frac{1}{4}$ in. long; bracteoles lanceolate-ovate, acute, with a few teeth on the margins, 5-nerved, the outermost nerves obscure, 1 - $1\frac{1}{2}$ in. long, $\frac{1}{2}$ in. broad. Calyx with about 12 long acute teeth, when the fruit is mature $\frac{1}{4}$ - $\frac{3}{8}$ in. long, the tube being $\frac{1}{2}$ lin. deep, without hairs or scales. Corolla and stamens unknown. Capsule $\frac{7}{8}$ -1 in. long, the beak 6-7 lin. long; seeds $\frac{1}{4}$ - $\frac{1}{3}$ in. long, ochraceous, covered with imbricate adpressed lamellæ.

Lower Guinea. Angola: between Lake Ivantala and Quilongues, *Welwitsch*, 5062! and near Lopollo and Lake Ivantala, *Welwitsch*, 31 (fruit), 827 (fruit).

Of doubtful position, but probably near *T. lancifolia*, T. Anders.

1. **Elytraria crenata**, Vahl. De Wildeman and Durand have described (Comptes-rendus Soc. Bot. Belg. xxxviii. 42), under the name *Tubiflora paucisquamosa*, an *Elytraria* which was sent to them by Dewèvre from Bania Lecoula, in the Upper Congo region, and by Calva from Gandayanga, in the Lower Congo region, which from their description seems to be the form of *E. crenata* named on p. 28, as distributed through the Great Western forest region from Lagos to the Gaboon River and eastwards to Niamniam Land. It does not appear to be *E. marginata*, Vahl, but is the *E. marginata* of Beauvois, of Nees, and of Hooker (ll. cc.). Lindau (l. c.) applies the name *Tubiflora squamosa* to it; but then he unites it and the common South American species, to which Jacquin's name, *Verbena squamosa* (Hort. Schoenb. i. 3, t. 5), obviously belongs.

1a. **Hygrophila lindaviana**, Burkill. Herb 20 in. high, more or less hirsute. Stems quadrangular. Leaves of the main stem sessile, lanceolate, auricled at the base, attenuate and acute at the apex, 3-7 in. long, $\frac{3}{4}$ -1 in. broad, the auricles 5 lin. long; smaller leaves stalked. Flowers white or pale purple, in dense clusters in the axils of the leaves, with thorns as in *H. spinosa*, which, however, are so short as to be hidden by the bracts and calyces; bracts and bracteoles lanceolate, acuminate, ciliate-hispid; spines $\frac{1}{2}$ in. long. Calyx with the upper sepal 1 in. long, the others shorter; the lower pair fused almost to the tips. Corolla-tube about 1 in. long. Stamens unequal, with the filaments of the lower pair broadened, each attached to the filament of the upper stamen of its side at the base. Capsule $\frac{1}{2}$ in. long, 8-10-seeded, elliptic-lanceolate.—*Asteracantha lindaviana*, De Wild. & Durand in Comptes-rendus Soc. Bot. Belg. xxxviii. 100, and Plant. Thonner. Congol. 39, t. v.

South Central. Congo Free State: Evamkoyo; near Businga, Thonner.

Very closely allied to *H. spinosa*, T. Anders., if truly distinct. The authors call attention to the unusual number of stopples (viz. four) which they observed in the pollen. They describe the pollen as having about 20 lines running from pole to pole, and state that the pollen of *H. spinosa* differs in having fewer; but this is not always the case.

16a. **Hygrophila rhodesiana**, S. Mocre in Journ. Bot. 1900, 201. A low plant, springing up after being cropped down. Old stems quadrangular, scarcely 1 lin. in diam., erect, glabrous. Leaves linear, conspicuously ciliate with white hairs, upwards of $\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. broad, acute, the midrib prominent below. Spikes very few-flowered, 1 or 2 flowers at each node; bracts like the leaves. Flowers conspicuous, purple. Calyx-lobes linear-subulate, ciliate, divided almost to the base, unequal, the longest $\frac{1}{2}$ in. long, the others 5 lin. long, almost setaceous at the tip. Corolla-tube as long as the calyx-lobes, suddenly widened into the throat; lower lobes $1\frac{1}{2}$ lin. long and almost 2 lin. broad, upper smaller. Stamens in two pairs, the filaments of those of each side

united, a little unequal. Capsule linear, 5 lin. long, $\frac{3}{4}$ lin. broad, 8-seeded.

Mozamb. Dist. British Central Africa: Rhodesia; Salisbury, *Rand*, 519!

1a. **Brillantaisia subcordata**, *De Wild. et Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 44. Herbaceous. Stem somewhat pilose. Lower leaves cordate, acuminate, decurrent on the petiole in very narrow wings, pilose on both sides, entire, $1\frac{1}{4}$ –3 in. long, $\frac{3}{4}$ –2 in. broad; the uppermost elliptic and sessile; petiole of the lower leaves about $1\frac{1}{4}$ in. long. Inflorescence many-flowered, glandular; bracts linear-ovate, pilose, the uppermost about $2\frac{1}{2}$ lin. long and $\frac{3}{4}$ lin. broad. Calyx-segments about equal, narrowly linear, sparingly clad with glandular hairs, 5 lin. long. Corolla violet; tube about $\frac{1}{4}$ in. long; lips 9–10 lin. long. Capsule 1 in. long.—*De Wild. & Durand, Contrib. Fl. Congo, i. fasc. 2, 47.*

South Central. Congo Free State: Bokakata, *Dewèvre*; Bangala, on the River Congo, *Dameuse*.

Var. *macrophylla*, *De Wild. & Durand, Contrib. Fl. Congo, i. fasc. 2, 47.* Herb, $1\frac{1}{2}$ –2 ft. high. Leaves larger than in the type, $4\frac{1}{2}$ –7 in. long, $2\frac{1}{2}$ – $5\frac{1}{2}$ in. broad; petiole 4 in. long.

South Central. Congo Free State: New Antwerp, *Duchesne*!

Very nearly allied to *B. Lamium*, Benth.

14a. **Brillantaisia Dewevrei**, *De Wild. et Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 45. Stem woody, 3–6 ft. high, tetragonous, pilose. Leaves ovate, 2–8 in. long, $1\frac{1}{4}$ – $4\frac{3}{4}$ in. broad, acuminate at the apex, somewhat cordate at the base and prolonged downwards in broad coarsely-toothed wings along the petiole, with white hairs; margins coarsely toothed; petiole 2 in. long, including the wings 5–14 lin. broad. Inflorescence racemiform, with glandular hairs, 8–11 in. long, bracteate. Calyx-segments linear, slightly broadened at the apex, the posterior 11 lin. long, the others 8 lin. long. Corolla with the upper lip white and about 13 lin. long; the lower lip purple, 13 lin. long; tube 4 lin. long. Stamens 10 lin. long.

South Central. Congo Free State: by the River Congo, between Lukolela and Gombi, *Dewèvre*.

Related to *B. patula*, T. Anders., and *B. vogeliana*, Benth.

5. **Mellera Briartii**, *De Wild. et Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 210. Leaves 1 by $\frac{1}{3}$ in., ovate, spathulate, 3-lobed at the tip, glabrous above, thinly hairy beneath. Flowers in terminal panicles; peduncle $\frac{1}{3}$ in. long, hairy; bracts 2, lanceolate, glandular-hairy. Calyx $\frac{2}{3}$ in. long, deeply 5-lobed. Corolla nearly 1 in. long; tube cylindrical; lobes 5, round, nearly equal. Anthers oblong, not spurred; pollen striate. Capsules tetragonal.

South Central. Congo Free State: Katanga; Nzilo Rapids, *Briart*.

The number of ovules is not mentioned, nor the aestivation of the corolla, nor whether it is 2-lipped. It does not appear to belong to *Mellera*.

long; limb $1\frac{1}{4}$ in. in diam. Capsule $\frac{1}{4}$ – $\frac{1}{3}$ by $\frac{1}{6}$ in.—Harv. Thes. Cap. ii. 27, t. 143.

Lower Guinea. Damaraland, *Miss Elliot*.
Also in extra-tropical Namaqualand.

1. **Blepharis boerhaaviæfolia**, *Pers.* Add: *B. boerhaaviæfolia*, var. *nigro-venulosa*, *De Wild. & Durand*, *Contrib. Fl. Congo*, i. fasc. 1, 46.

Lower Guinea. Lower Congo: Moanda, *Vanderyst*.

This variety is not new; it is *Schweinfurth*, 2761, mentioned on p. 96.

7a. **Blepharis tenuiramea**, *S. Moore in Journ. Bot.* 1900, 205. Branches 2 in. long, slender, erect, much-dividing, strigose, finally glabrous. Leaves 1 – $2\frac{1}{2}$ in. long, narrow-linear, spinous-acuminate, approximated in very unequal pairs, rarely spinous on the margin. Flower-branches very short, closely clustered near the ground, 1-flowered; floral leaves lanceolate-oblong; bract oblanceolate, spinous on the margin; bracteoles 0. Corolla $\frac{1}{2}$ – $\frac{2}{3}$ in. long. Cells of the ovary 1-ovuled. Capsule $\frac{1}{3}$ in. long, ellipsoid.

Mozamb. Dist. British Central Africa: Nyasaland, *Buchanan*, 387.

29. **Blepharis grossa**, *T. Anders. in Journ. Linn. Soc.* vii. 36. Scabrous hairy. Branches 6–10 in. long, bearing no spikes except close to the base. Leaves $1\frac{1}{2}$ by $\frac{1}{8}$ in., entire, many approximate in fours. Spikes clustered close to the crown of the root, 2 by 1 in., 20–30-flowered, densely hirsute; bracts 1 by $\frac{1}{2}$ in., sub-4-ranked, rigid, with spinous teeth; bracteoles $\frac{1}{4}$ in. long, linear. Calyx hairy within and without; anticous segment $\frac{1}{3}$ in. long. Capsule $\frac{1}{4}$ in. long, flattened, 2-seeded.—*Acanthodium grossum*, *Nees in DC. Prod.* xi. 274, not of *Wight*.

Lower Guinea. Angola, *Curror*!

1. **Thomandersia laurifolia**, *Baill.* Add: *T. Hensii*, *De Wild. & Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 108.

South Central. Congo Free State: Coquilhatville, *Dewèvre*; Bangala, *Hens*, C. 113!

2. **Thomandersia congolana**, *De Wild. et Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 107. Corolla red-brown; tube $\frac{1}{6}$ in. long, lobes $\frac{1}{12}$ in. long; otherwise as *T. laurifolia*, *Baill.*

Lower Guinea. Lower Congo, *Cabra*.

South Central. Congo Free State: between Sa'embao and Léopoldville, *Dewèvre*.

9a. **Barleria Randii**, *S. Moore in Journ. Bot.* 1900, 203. Plant glabrescent. Leaves elliptic, spinous-acuminate, cuneate at the base, hyaline on the margins; floral leaves similar to the others; interpetiolar

spines rigid, flattened, much shorter than the leaves. Bracts similar to the interpetiolar spines; inflorescence short, few-flowered. Posticous sepal oblong-ovate, spinous-acuminate; 2 anticous sepals connate to the tip. Corolla yellow, 2-lipped; anticous lobe oblong, much shorter than the 4 posticous lobes. Filaments of the stamens puberulous.

Mozamb. Dist. British Central Africa: Rhodesia; Buluwayo, *Rand*, 115.

25a. **Barleria Delamerei**, *S. Moore in Journ. Bot.* 1900, 206. An undershrub. Leaves $\frac{1}{4}$ – $\frac{1}{2}$ in. long, ovate, spinulose-mucronate, cuneate at the base, pubescent. Racemes one-sided, short, 1–3-flowered. Interpetiolar spines paired, sparingly branched, as long as the leaves; bracts similar to the interpetiolar spines. Outer sepals $\frac{2}{3}$ – $\frac{3}{4}$ in. long, oblong, strongly spine-toothed. Corolla $1\frac{1}{3}$ in. long, blue. Stamens 2, with 2 rudiments. Perfect ovules 2 in each cell of the ovary.

Nile Land. British East Africa: Lake Marsabit, *Lord Delamere*.

61a. **Barleria Briartii**, *De Wild. et Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 212. Branches villous, white. Leaves $1\frac{1}{2}$ – $2\frac{1}{2}$ by 1 in., ovate-elliptic, nearly sessile, very hairy and white beneath. Flowers $1\frac{1}{4}$ in. long, solitary, axillary. Calyx $\frac{3}{4}$ in. long; anticous segment obscurely 2-toothed. Ovary hairy, white.

South Central. Congo Free State: mountains of the gorges of the Nzilo River, *Briart*.

Described as very near *B. ventricosa*.

20a. **Justicia elegantula**, *S. Moore in Journ. Bot.* 1900, 204. Plant 2–3 in. high, loosely hairy. Stem-leaves $\frac{1}{4}$ – $\frac{1}{3}$ in. long, linear-oblongate, obtuse. Spikes many-flowered, interrupted at the base; floral leaves similar to the stem-leaves, much longer than the subulate bracts. Calyx-segments nearly $\frac{1}{3}$ in. long, linear, closely ciliate-hairy. Corolla nearly $\frac{1}{2}$ in. long, fine purple. Ovary glabrous, with 4 ovules.

Mozamb. Dist. British Central Africa: Rhodesia; Salisbury, *Rand*, 508.

Var. *elatior*, *S. Moore*, l.c. More robust, 5 in. high; spikes elongate.

Mozamb. Dist. British Central Africa: Rhodesia; Salisbury, *Rand*, 642.

Var. *repens*, *S. Moore*, l.c. Stem creeping, pubescent. Leaves up to $\frac{1}{3}$ in. broad.

Mozamb. Dist. British Central Africa: Rhodesia; Salisbury, *Rand*, 509.

48. **Justicia odora**, *Vahl*. The name *J. leucodermis*, *Schinz*, is given erroneously as a synonym of *J. odora* on p. 201; it belongs to a species of *Monechma* found, as yet, only to the south of the Tropic of Capricorn.

64. **Justicia extensa**, *T. Anders*. Add: *Duvernoya Dewevrei*, *De Wild. & Durand in Comptes-rendus Soc. Bot. Belg.* xxxviii. 102.

South Central. Congo Free State: Basankussu, on the Lulonga River *Dewèvre*.

No example of *Duvernoya Dewevrei* has been seen; from the description it ranks as a subdivision of *J. extensa*.

71a. **Justicia Goetzei**, Lindau in Engl. Jahrb. xxviii. 484. Stem simple, a span long, pubescent. Leaves petioled, subcordate-ovate, rounded at the tip, pubescent. Spikes axillary, peduncled, one-sided; flowers rather large, glabrous without, pubescent within. Calyx-segments 5, unequal. Lower cells of the anthers long-tailed. Capsule unknown.

Mozamb. Dist. German East Africa: Uhehe; Ukano Mountain, 6000 ft., Goetze, n. 685.

72a. **Justicia exigua**, S. Moore in Journ. Bot. 1900, 204. Stem slender, creeping, puberulous. Leaves $\frac{1}{4}$ – $\frac{1}{2}$ in. long, ovate, obtuse, early glabrescent. Spikes several-flowered, $\frac{2}{3}$ in. long; floral leaves minute, subulate. Calyx-segments $\frac{1}{8}$ in. long, subulate. Corolla $\frac{1}{8}$ in. long, spotted. Ovules 2 in each cell of the ovary.

Mozamb. Dist. British Central Africa: Rhodesia; Buluwayo, Rand, 389. Also collected just south of the Tropic.

1. **Rhinacanthus communis**, Nees. Add: *R. parviflorus*, T. Anders. ex De Wild. & Durand in Comptes-rendus Soc. Bot. Belg. xxxviii. 105. *R. Dewevrei*, De Wild. & Durand l.c.

South Central. Congo Free State: in thickets at Bokakata, Dewèvre.

No example of *R. Dewevrei* has been seen; from the reference to *R. parviflorus*, T. Anders., it would appear that *R. Dewevrei* is a subdivision of *R. communis*. *Pseuderanthemum lindavianum*, De Wild. & Durand in Comptes-rendus Soc. Bot. Belg. xxxviii. 104, appears to be *Rhinacanthus communis* also. It was collected by Dewèvre at Chimbeta in the Congo Free State (Lower Guinea); and De Wildeman and Durand, who neglect to describe the anthers, diagnose it thus:—Branches with ferruginous hairs. Inflorescences spike-like, axillary or terminal, more or less interrupted at the base; bracts $\frac{1}{8}$ in. long. Flowers several in the axils of the bracts, rose-white. Calyx $\frac{1}{5}$ in. long. Corolla 2-lipped; tube $1\frac{1}{3}$ by $\frac{1}{8}$ in. Capsule $\frac{2}{3}$ by $\frac{1}{8}$ in., stalked, velvety. Seeds 4, round, compressed, $\frac{1}{8}$ in. diam., rugose-reticulate.

2a. **Ecbolium Clarkei**, Hiern in Cat. Afr. Pl. Welw. i. p. 1032. Leaves not panduriform. Bracts narrower, not cordate. Seeds not tuberculate. Otherwise as *E. amplexicaule*, S. Moore. *E. amplexicaule*, C. B. Clarke, supra, p. 237, in part, not of S. Moore.

Lower Guinea. Angola: Loanda, Welwitsch, 5124! 5203! Ambriz, Monteiro!

The name *Ecbolium amplexicaule*, S. Moore, belongs to the Nile Land plant collected by Gregory.

1. **Peristrophe bicalyculata**, Nees. Add: Lindau in Engl. Jahrb. xxviii. 484; De Wild. & Durand in Comptes-rendus Soc. Bot. Belg. xxxvi. 84. *P. Dewevrei*, De Wild. & Durand in Comptes-rendus Soc. Bot. Belg. xxxviii. 103.

Lower Guinea. Lower Congo: Zobi, Dewèvre.

South Central. Congo Free State: Mtowa, Descamps; Lufira, Descamps.

Mozamb. Dist. German East Africa: Ukami; South Uluguru Mountains, Goetze, 355.

No example of *P. Dewevrei* has been seen; from the description it would be a subdivision of *P. bicalyculata*.

1a. **Peristrophe Doræ**, *Terracciano in Ann. Istit. Bot. Roma*, v. 102. Stem hairy. Leaves hairy on the nerves and margins. Panicles axillary, twice or thrice dichotomously cymose with a peduncled flower at the dichotomous division; otherwise as *P. bicalyculata*, Nees.

Nile Land. Eritrea: Ferehan Volcano, *Terracciano*.

Described as close to *P. bicalyculata*, only differing in the hairiness and characteristic inflorescence. These, however, as described, can be found in *P. bicalyculata*.

16. **Dicliptera Melleri**, *Rolfe*. Add: *Diapedium Melleri*, S. Moore in *Journ. Bot.* 1900, 205.

Mozamb. Dist. British Central Africa: Rhodesia: Salisbury, *Rand*, 507B.

4a. **Lantana subtracta**, *Hiern in Cat. Afr. Pl. Welw.* i. 828. A perennial herb, with sarmentose hispid stems 1-1½ ft. long. Leaves opposite, mostly spreading, ovate-oblong or obovate, 1-1½ in. long, rigidly herbaceous, obtuse, narrowed to the base, crenate, yellowish-green, scabrous. Heads solitary in the axils of the lower leaves, ovoid or globose, ⅓-½ in. long; bracts ovate or elliptic, hispidulous on the back, the central ones ¼ in. long. Calyx ⅓ in. long, compressed, keeled, not winged. Corolla white, ⅓ in. long. Fruit ovoid, rather compressed.

Lower Guinea. Angola: Huilla; in hilly places and in thickets near Lopollo, *Welwitsch*, 5756!

4. **Stachytarpheta mutabilis**, *Vahl*. Add: *Valerianoides mutabilis*, O. Kuntze, *Rev. Gen.* ii. 510; *Hiern in Cat. Afr. Pl. Welw.* i. 830.

5a. **Premna polita**, *Hiern in Cat. Afr. Pl. Welw.* i. 832. A shrub 4-6 ft. high; young branches pubescent. Leaves shortly petioled, ovate, 2-3 in. long, acuminate at the apex, rounded at the base, entire or slightly repand on the revolute margin, thinly coriaceous, deep green and rather glossy above, slightly pubescent. Cymes terminal, 2-3 in. in diam.; pedicels short; bracts linear. Calyx campanulate, ⅓ in. long, glandular-pubescent, unequally 5-lobed; lobes obtuse. Corolla glandular-pubescent, hairy inside at the throat; lobes small. Stamens glabrous. Fruit globose, ⅓-¼ in. in diam.

Lower Guinea. Angola: Golungo Alto; thickets of Alto Queta Mountains, *Welwitsch*, 5656! 5725.

Habit of *Clerodendron glabrum*, E. Meyer. *Welwitsch*, 5725, in the Kew set is *Clerodendron myricoides*.

6. **Clerodendron conglobatum**, *Baker*. Add: *Siphonanthus conglobata*, *Hiern in Cat. Afr. Pl. Welw.* i. 840.

7. **Clerodendron Kentrocaule**, *Baker*. Add: *Siphonanthus costulata*, *Hiern in Cat. Afr. Pl. Welw.* i. 843.

8. **Clerodendron glabrum**, *E. Meyer*. Add: *Siphonanthus glabra*, *Hiern in Cat. Afr. Pl. Welw.* i. 842, where are described two varieties, *incarnata* and *vaga*, both from Angola.

9. **Clerodendron volubile**, Beauv. Add: *Siphonanthus volubilis*, Hiern in Cat. Afr. Pl. Welw. i. 842.

9a. **Clerodendron botryodes**, Baker. A sarmentose glabrous shrub. Leaves opposite or alternate, distinctly petioled, oblong, 3–12 in. long, $1\frac{1}{2}$ –5 in. broad, acuminate, rounded or subcordate at the base, entire or slightly toothed. Panicle oblong, 2–9 in. long; branches pubescent; pedicels $\frac{1}{20}$ – $\frac{1}{16}$ in. long. Calyx campanulate-oblong, $\frac{1}{5}$ in. long, glandular-pubescent; lobes deltoid, acute. Corolla white, $\frac{1}{2}$ – $\frac{5}{8}$ in. long; lobes obovate, not very unequal, $\frac{1}{6}$ in. long.—*Siphonanthus botryodes*, Hiern in Cat. Afr. Pl. Welw. i. 843.

Lower Guinea. Angola: district of Golungo Alto, *Welwitsch*, 5662! 5711, 5714.

9b. **Clerodendron thyrsoideum**, Gürke in *Engl. Jahrb.* xxviii. 293, not of Baker. A shrub. Leaves distinctly petioled, elliptic, 2–4 in. long, rounded at the base, entire, acuminate, coriaceous, glabrous on both surfaces. Inflorescence a thyrsoid panicle 10–12 in. long. Calyx broadly campanulate, $\frac{1}{3}$ in. long; teeth 5, ovate-deltoid. Corolla-tube broad, $\frac{1}{3}$ – $\frac{1}{2}$ in. long; lobes oblong, $\frac{1}{5}$ – $\frac{1}{4}$ in. long.

South Central. Congo Free State: without precise locality, *Dewèvre*, 812.

9c. **Clerodendron bipindense**, Gürke in *Engl. Jahrb.* xxviii. 296. A climbing shrub, with slender terete glabrous branchlets. Leaves shortly petioled, oblong, 5–6 in. long, broadly cuneate at the base, entire, cuspidate at the apex, membranous, green and glabrous on both surfaces. Cymes very lax, axillary, peduncled; pedicels very long. Calyx campanulate, glabrous, $\frac{1}{12}$ in. long; teeth 5, small, deltoid. Corolla yellowish, pubescent; tube cylindrical, $\frac{3}{4}$ in. long; lobes small, obovate. Style twice as long as the corolla-tube.

Upper Guinea. Cameroons: in forests to the north of Victoria, 300 ft., *Preuss*, 1358; in forests near Bipinde, *Zenker*, 1217! Ebea Rocks, *Dinklage*, 288; near Batanga, *Dinklage*, 1367.

10. **Clerodendron Formicarum**, Gürke. Add: *Siphonanthus Formicarum*, Hiern in Cat. Afr. Pl. Welw. i. 843.

10a. **Clerodendron yaundense**, Gürke in *Engl. Jahrb.* xxviii. 297. A shrub, with slender terete glabrous branchlets. Leaves opposite, shortly petioled, ovate, 2–5 in. long, broadly cuneate at the base, entire, cuspidate, firm in texture, green and glabrous on both surfaces. Cymes lax, terminal, shortly peduncled, subumbellate. Calyx campanulate, glabrous, $\frac{1}{12}$ in. long; teeth small, deltoid. Corolla yellowish-white; tube cylindrical, twice as long as the calyx; lobes small, obovate. Stamens twice the length of the corolla-lobes.

Upper Guinea. Cameroons: Yaunde, 2500 ft., *Zenker*, 319, 561, 813! *Zenker & Staudt*, 485.

13a. **Clerodendron glabratum**, Gürke in *Engl. Jahrb.* xxviii. 295. A shrub. Leaves ovate-elliptic, 2–4 in. long, narrowed to the

base, entire, acuminate, glabrous on both surfaces. Cymes many-flowered; branches downy. Calyx-tube campanulate, downy; teeth deltoid-acuminate. Corolla-tube $\frac{1}{4}$ in. long; lobes broadly elliptic, $\frac{1}{10}$ in. long.

Mozamb. Dist. German East Africa: Usaramo; Konduchi, *Stuhlmann*, 7996.

22. **Clerodendron splendens**, *G. Don.* Add: *Siphonanthus splendens*, Hiern in *Cat. Afr. Pl. Welw.* i. 841.

Var. *Bakeri*, Baker, is a plant with villous-tomentose leaves, and with petioles up to 6 in. long.—*Siphonanthus splendens*, var. *Bakeri*, Hiern, l.c.

Upper Guinea. Sierra Leone, *Welwitsch*, 5653.

24a. **Clerodendron longitubum**, *De Wild. et Durand in Comptes-rendus Soc. Bot. Belg.* xxxix. 74. A climbing shrub, with velvety branchlets. Leaves petioled, oblong, 6–8 in. long, acuminate at the apex, cuneate at the base, undulated on the margin, glabrous above, velvety beneath. Cymes compact, axillary, long-peduncled; pedicels $\frac{1}{8}$ – $\frac{1}{6}$ in. long; bracts filiform. Calyx funnel-shaped, subglabrous, $\frac{1}{6}$ – $\frac{1}{5}$ in. long; lobes short, deltoid. Corolla-tube above 1 in. long; lobes oblong, subequal, $\frac{1}{5}$ in. long. Stamens exerted $\frac{1}{2}$ in. from the tube.

Lower Guinea. Congo Free State: Kisantu, on the Inkissi River, *Gillet*.

29a. **Clerodendron Thonneri**, *Gürke in Engl. Jahrb.* xxviii. 292. An erect shrub. Leaves distinctly petioled, elliptic, 4–6 in. long, entire, rounded at the base, acute, glabrous on both surfaces. Cymes axillary and terminal, 2–3 in. long; pedicels $\frac{1}{3}$ in. long. Calyx campanulate, $\frac{1}{3}$ in. long; teeth 5, short. Corolla white; tube nearly an inch long; lobes elliptic, subobtusate.

South Central. Congo Free State: Boyangi, near Ndobu, on the Congo, 1300 ft., *Thonner*, 69.

34a. **Clerodendron congestum**, *Gürke in Engl. Jahrb.* xxviii. 296. An undershrub. Leaves distinctly petioled, broadly ovate, $1\frac{1}{2}$ –3 in. long, cordate at the base, entire, acute, membranous, subglabrous. Cymes terminal, congested. Calyx campanulate, glabrous, $\frac{1}{4}$ in. long; teeth lanceolate, acuminate, $\frac{1}{6}$ in. long. Corolla-tube $\frac{3}{4}$ in. long; lobes ovate, obtuse.—*Gürke in Engl. Jahrb.* xxviii. 466.

Mozamb. Dist. German East Africa: Ukami; on dry slopes of the southern Uluguru Mountains, 3200 ft., *Goetze*, 213; Mrogoro, *Stuhlmann*, 8219, 8237.

34b. **Clerodendron polyanthum**, *Gürke in Engl. Jahrb.* xxviii. 295. A shrub or tree. Leaves alternate, distinctly petioled, elliptic, $1\frac{1}{2}$ – $2\frac{1}{2}$ in. long; entire, rounded at the base, acute, pubescent on both surfaces. Cymes terminal, many-flowered. Calyx broadly campanulate, glabrous, $\frac{1}{4}$ – $\frac{1}{3}$ in. long; teeth 5, lanceolate, acuminate, $\frac{1}{5}$ in. long. Corolla-tube nearly an inch long; lobes oblong.

Mozamb. Dist. German East Africa: Usaramo; in moist wooded valleys, *Stuhlmann*, 8274.

34c. **Clerodendron ulugurense**, *Gürke in Engl. Jahrb.* xxviii. 294. A shrub or tree. Leaves distinctly petioled, ovate, 2–3 in. long, cordate at the base, entire, acute, pubescent on both surfaces. Cymes axillary, 15–25-flowered; branches downy; bracts lanceolate. Calyx $\frac{1}{2}$ in. long; tube turbinate; lobes 5, lanceolate-acuminate, $\frac{1}{4}$ – $\frac{1}{3}$ in. long. Corolla-tube nearly an inch long.—*Gürke in Engl. Jahrb.* xxviii. 465.

Mozamb. Dist. German East Africa: Ukami; Uluguru Mountains, near Tui unguo, *Stuhlmann*, 8691.

36a. **Clerodendron Dusenii**, *Gürke in Engl. Jahrb.* xxviii. 293. A shrub. Leaves shortly petioled, obovate, 2–5 in. long, rounded at the base, entire, acuminate, glabrous on the upper surface, pubescent on the ribs beneath. Cymes many-flowered. Calyx campanulate, pubescent, $\frac{1}{5}$ in. long; teeth small, deltoid. Corolla and fruit unknown.

Upper Guinea. Cameroons; Ssangille, *Dusén*, 326.

37a. **Clerodendron subreniforme**, *Gürke in Engl. Jahrb.* xxviii. 291. An erect tree or shrub. Leaves distinctly petioled, broadly reniform or orbicular or broadly ovate, $1\frac{1}{2}$ –2 in. long, $1\frac{1}{2}$ –3 in. broad, entire, cordate at the base, shortly cuspidate, minutely pubescent on both surfaces. Cymes 6–12-flowered, corymbose, terminal and axillary; peduncle hairy, 2–3 in. long. Calyx $\frac{1}{2}$ – $\frac{5}{8}$ in. long; tube campanulate; lobes deltoid, acute, $\frac{1}{3}$ in. long. Corolla unknown. Fruit ovoid, $\frac{1}{2}$ in. long.

South Central. Congo Free State: without precise locality, *Dewèrre*, 917.

40. **Clerodendron strictum**, *Baker*. Add: *Siphonanthus stricta*, *Hiern in Cat. Afr. Pl. Welw.* i. 840.

41. **Clerodendron capitatum**, *Schumacher & Thonn.* var. **cephalanthum**, *Baker*. Add: *C. capitatum*, *Hook. Bot. Mag.* t. 4355. *C. Whitfieldii*, *Seem. in Bonplandia*, x. 250.

44. **Clerodendron megasepalum**, *Baker*. Add: *Siphonanthus sanguinea*, *Hiern in Cat. Afr. Pl. Welw.* i. 839. Under the same name *Hiern* includes *Welwitsch*, 5688—the type of *C. orbiculare* (p. 307), possibly rightly; and it is probable that *C. hysteroanthum*, *Baker* (p. 306) should be included also.

45. **Clerodendron cuneifolium**, *Baker*. Add: *Siphonanthus cuneifolia*, *Hiern in Cat. Afr. Pl. Welw.* i. 841.

47. **Clerodendron speciosum**, *Gürke*. The author, in *Engl. Jahrb.* xxviii. 291, changes the name of this species to **C. angolense**, to avoid confusion with the hybrid *C. speciosum*, mentioned under *C. splendens*.

52. **Clerodendron Welwitschii**, *Gürke*. Add: *Siphonanthus Welwitschii*, *Hiern in Cat. Afr. Pl. Welw.* i. 839.

57. **Clerodendron thyrsoideum**, Baker. Name to be changed to **C. Mannii**, Baker, the adjective '*thyrsoideum*' having been used by Gürke for another species.

58. **Clerodendron myricoides**, R. Br. Add: *Siphonanthus myricoides*, Hiern in Cat. Afr. Pl. Welw. i. 844. Hiern names a variety *herbacea* (p. 845), which is founded on a herbaceous perennial form, collected by Welwitsch in Angola, No. 5768. Gürke (Engl. Jahrb. xxviii. 299) makes four varieties—*microphyllum*, *grosseserratum*, *camperum*, and *laxum*—upon the variation of the leaf.

58a. **Clerodendron silvicola**, Gürke in Engl. Jahrb. xxviii. 299. A shrub 10–12 ft. high. Leaves shortly petioled, elliptic, narrowed to the base, acute, strongly serrate, glabrous on the upper surface, hairy on the ribs beneath. Panicle lax, terminal; bracts lanceolate, $\frac{1}{8}$ in. long, hairy. Calyx campanulate, pilose, $\frac{1}{4}$ in. long; teeth small, deltoid, subobtuse. Corolla white; tube broad, scarcely twice the length of the calyx.—Gürke in Engl. Jahrb. xxviii. 466.

Mozamb. Dist. German East Africa: Uhehe; on the Kigulu Plateau, northern Uchungwe Mountain, 5800 ft., Goetze, 563.

58b. **Clerodendron Dekindtii**, Gürke in Engl. Jahrb. xxviii. 301. A shrub 6–12 ft. high. Leaves petioled, obovate-lanceolate, 1–1 $\frac{1}{2}$ in. long, narrowed to the base, entire, acute, pubescent on both surfaces. Cymes terminal, lax, few-flowered. Calyx broadly campanulate, $\frac{1}{6}$ in. long, pubescent; teeth suborbicular, obtuse, as long as the tube. Corolla blue; tube twice the length of the calyx.

Lower Guinea. Angola: Huilla, 5800 ft., Dekindt, 366, Antunes, 366.

58c. **Clerodendron Scheffleri**, Gürke in Engl. Jahrb. xxviii. 301. A climbing shrub. Leaves petioled, obovate-lanceolate, 3–5 in. long, narrowed to the base, acuminate, serrate, membranous, glabrous on both surfaces. Panicle lax, terminal; pedicels $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Calyx campanulate, $\frac{1}{4}$ in. long; lobes orbicular, obtuse, as long as the tube. Corolla whitish; tube $\frac{1}{2}$ in. long; lobes oblong; stamens protruding 1 $\frac{1}{2}$ in. from the throat of the corolla-tube.

Mozamb. Dist. German East Africa: Usambara; in a swamp by the Quam-cuju River near Nguelo, 3000 ft., Scheffler, 57.

58d. **Clerodendron suffruticosum**, Gürke in Engl. Jahrb. xxviii. 302. An erect undershrub 3–4 ft. high. Leaves petioled, broadly elliptic, 4–5 in. long, narrowed to the base, acute, strongly serrate, pubescent on both surfaces. Panicle terminal; pedicels $\frac{1}{4}$ in. long. Calyx broadly campanulate, tomentose; lobes ovate, obtuse, as long as the tube. Corolla unknown.—Gürke in Engl. Jahrb. xxviii. 466.

Mozamb. Dist. German East Africa: Ukami; southern Uluguru Mountains, 4000–5800 ft., Goetze, 191.

58e. **Clerodendron dumale**, Baker. A shrub 1–2 ft. high. Branches softly pubescent. Leaves opposite, shortly petioled, ovate or

oblong, 1–1½ in. long, obtuse or acute, narrowed to the base, entire or nearly so, clothed with short stiff hairs and minute glands, especially on the lower surface. Inflorescence terminal, 2–4 in. long; pedicels up to ½ in. long. Calyx campanulate, ⅓–¼ in. long, minutely glandular and beset with short stiff hairs; lobes obtuse, imbricate, ciliate. Corolla blue; tube ¼–⅔ in. long; lobes unequal, oval or obovate, obtuse ⅓–½ in. long.—*Siphonanthus dumalis*, Hiern in Cat. Afr. Pl. Welw. i. 846.

Lower Guinea. Angola: Huilla; near Lopollo, *Welwitsch*, 3914, 5763.

58f. **Clerodendron kissakense**, *Gürke in Engl. Jahrb.* xxviii. 304. Stem glabrous, erect, 1½–2 ft. high. Leaves lanceolate, 1½–2 in. long, narrowed to the base, shortly acuminate, irregularly serrate, rather fleshy, glabrous on both surfaces. Inflorescence subspicate; bracts lanceolate; pedicels long. Calyx broadly campanulate, ¼ in. long; limb oblique; lobes semiorbicular, as long as the tube. Corolla-tube a little longer than the calyx; lower lip cymbiform.—*Gürke in Engl. Jahrb.* xxviii. 466.

Mozamb. Dist. German East Africa: Usagara; near Kissake (? Kisiki), 800 ft., *Goetze*, 42.

58g. **Clerodendron caesium**, *Gürke in Engl. Jahrb.* xxviii. 300. A shrub, 12–20 ft. high. Leaves opposite, very shortly petioled, elliptic, 2–5 in. long, narrowed to the base, acute, serrate, membranous, pilose only on the ribs. Panicle lax, terminal; pedicels ⅓ in. long. Calyx broadly campanulate, ⅓ in. long; teeth deltoid, as long as the tube. Corolla pale blue; tube twice the length of the calyx.—*Gürke in Engl. Jahrb.* xxviii. 466.

Mozamb. Dist. German East Africa: Uhehe; Uchungwe Mountain, in forest near Muhanga, 5800 ft., *Goetze*, 633.

61. **Clerodendron Kalbreyeri**, *Baker*. The name for this species is slightly antedated by **C. violaceum**, *Gürke in Engl. Jahrb.* xxviii. 303.

62. **Clerodendron carnosulum**, *Baker*. Add: *Siphonanthus assurgens*, Hiern in Cat. Afr. Pl. Welw. i. 845.

2. **Vitex sulphurea**, *Baker*. Add: *Premna colorata*, Hiern in Cat. Afr. Pl. Welw. i. 833.

7a. **Vitex quadrangula**, *Gürke in Engl. Jahrb.* xxviii. 463. A tree 20–30 ft. high, with quadrangular pubescent branchlets. Leaves long-petioled, 5-foliolate; leaflets obovate-oblong, 5–6 in. long, shortly stalked, acute, pubescent. Panicle terminal, thyrsoid, 8–12 in. long. Calyx campanulate, ⅓ in. long; teeth broad. Corolla twice the length of the calyx; tube pilose inside. Stamens not longer than the corolla-lobes.

Mozamb. Dist. German East Africa: Ukami; South Uluguru Mountains, 3200 ft., *Goetze*, 157.

21a. **Vitex Goetzei**, *Gürke in Engl. Jahrb.* xxviii. 464. A tree-like shrub. Leaves long-petioled, 3-foliolate; leaflets subacute, coriaceous, glabrescent above, pubescent on the ribs beneath; central one obovate-cuneate, shortly stalked, $1\frac{1}{2}$ – $2\frac{1}{2}$ in. long. Cymes few-flowered, axillary, long-peduncled; pedicels obsolete. Calyx campanulate, $\frac{1}{3}$ in. long; teeth deltoid. Corolla-tube curved, scarcely longer than the calyx. Filaments hairy at the base.

Mozamb. Dist. German East Africa: Usagara; on the steppe south of Rufidji, 800 ft., *Goetze*, 85.

23. **Vitex holocalyx**, *Baker*. Add: *V. madiensis*, *Oliv.*, var. *parvifolia*, *Hiern in Cat. Afr. Pl. Welw.* i. 834.

30. **Vitex ferruginea**, *Schumach. et Thonn.* Add: *V. guerkeana*, *Hiern in Cat. Afr. Pl. Welw.* i. 835.

32. **Vitex grisea**, *Baker*. Add: *V. huillensis*, *Hiern in Cat. Afr. Pl. Welw.* i. 837.

50a. **Vitex cuspidata**, *Hiern in Cat. Afr. Pl. Welw.* i. 835. A tall tree, with softly tomentose branchlets. Leaves long-petioled, 3–5-foliolate; leaflets shortly stalked, obovate, $2\frac{1}{2}$ – $4\frac{1}{2}$ in. long, acutely cuspidate at the apex, cuneate at the base, entire, deep green and rather glossy, minutely tubercled or scaly on the upper surface, softly tomentose beneath. Cymes lax, axillary, long-peduncled. Flowers unknown. Fruit-calyx campanulate, pubescent, $\frac{1}{5}$ in. long, shallowly lobed. Young fruit ovoid, $\frac{1}{3}$ in. long, obtuse, nearly glabrous.

Lower Guinea. Angola: Golungo Alto; in elevated forests, *Welwitsch*, 5665!

54. **Vitex puberula**, *Baker*. Add: *V. doniana*, var. ?, *pumila*, *Hiern in Cat. Afr. Pl. Welw.* i. 837.

55. **Vitex golungensis**, *Baker*. Add: *V. doniana*, *Hiern in Cat. Afr. Pl. Welw.* i. 836.

57a. **Vitex iringensis**, *Gürke in Engl. Jahrb.* xxviii. 464. A tree. Leaves long-petioled, 5-foliolate; leaflets obovate-oblong, sessile, 4 in. long, shortly acuminate, entire, narrowed to the base, glabrous on the upper surface, pubescent beneath. Cymes axillary; bracts lanceolate; pedicels very short. Calyx campanulate, $\frac{1}{4}$ in. long; teeth deltoid, acute. Corolla-tube rather longer than the calyx.

Mozamb. Dist. German East Africa: Uhehe; Rugare, near Iringo, 4800 ft., *Goetze*, 548.

2. **Ocimum canum**, *Sims*. Add: *O. americanum*, *Mill.*; *Hiern in Cat. Afr. Pl. Welw.* i. 848.

20a. **Ocimum rotundifolium**, *Gürke in Engl. Jahrb.* xxviii. 472. Stems simple, 6–8 in. long. Leaves shortly petioled, broadly

ovate or suborbicular, 1-1½ in. long and broad, obtuse, toothed, pubescent on both surfaces. Inflorescence racemose, lax, simple, terminal; whorls 4-6-flowered. Fruit-calyx pubescent, ½ in. long; upper tooth broadly ovate; lateral teeth truncate; lower setaceous. Corolla white. Stamens an inch or more long; posterior filaments with a tooth near the base.

Mozamb. Dist. German East Africa: Uhehe; plateau near Rugaro, in the neighbourhood of Iringa, 4800 ft., *Goetze*, 542.

23a. **Ocimum huillense**, *Hiern in Cat. Afr. Pl. Welw.* i. 851. A suffruticose herb, with stems 15 in. long, ascending from a decumbent base, clothed with short white hairs. Leaves shortly petioled, narrowly elliptical, 3 in. long, ¾ in. broad, subacute, cuneate at the base, repand or remotely denticulate, sparingly clothed with short whitish hairs. Inflorescence terminal, 4 in. long; whorls 6-flowered, lower distant. Calyx campanulate, ¼ in. long; upper tooth ovate; lower teeth short, subulate. Corolla ⅝ in. long; tube rather longer than the calyx. Upper stamens with filaments toothed near the base.

Lower Guinea. Angola: district of Huilla, *Welwitsch*, 5188.

23b. **Ocimum heckmannianum**, *Gürke in Engl. Jahrb.* xxviii. 472. An undershrub 1-1½ ft. high. Leaves shortly petioled, obovate-lanceolate, 1-1½ in. long, acute, narrowed to the base, indistinctly toothed, pubescent on both surfaces. Inflorescence racemose, short; whorls 6-8-flowered. Fruit-calyx ½ in. long; upper tooth suborbicular; lateral teeth truncate; lower subulate. Corolla violet. Stamens long, much exserted; posterior filaments with a tooth near the base.

Mozamb. Dist. German East Africa: Ukami; South Uluguru Mountains, on the watershed between the Mgeta River and Mbukana River, 2600 ft., *Goetze*, 333.

23c. **Ocimum roseoviolaceum**, *Gürke in Engl. Jahrb.* xxviii. 471. An undershrub 6-7 ft. high. Leaves very shortly petioled, crowded, broadly ovate, ½-1 in. long, acute, entire, glabrous on the upper surface, pubescent beneath. Inflorescence racemose, short, terminal. Fruit-calyx pubescent, ¼-⅓ in. long; upper tooth obovate; lateral teeth truncate; lower very long, setaceous. Corolla red-violet, striate. Stamens 1 in. long; posterior filaments with a tooth near the base.

Mozamb. Dist. German East Africa: Uhehe; on Uchungwe Mountain, near Dabagga, 6500 ft., *Goetze*, 640.

25a. **Ocimum tuberosum**, *Baker*. An erect wiry herb a foot high, with a thick tuberous-woody root. Stems pubescent upwards. Leaves sessile, narrowly elliptical, 1-2½ in. long, obtuse or subacute, cuneate at the base, toothed, glabrous or nearly so. Inflorescence terminal, 1½-2 in. long; whorls about 6-flowered; pedicels very short. Calyx campanulate, ¼ in. long; upper tooth broad, minutely apiculate; lateral teeth subulate; lower very short. Corolla-tube short. Posterior

filaments with a pubescent tooth near the base.—*Hemizygia tuberosa*, Hiern in Cat. Afr. Pl. Welw. i. 852.

Lower Guinea. Angola : Pungo Andongo ; in dry hilly thickets, *Welwitsch*, 5565.

38a. **Ocimum andongense**, *Hiern in Cat. Afr. Pl. Welw. i. 850*. An erect perennial herb. Stems nearly 2 ft. long, pubescent upwards. Leaves opposite, linear or linear-oblong, sessile or shortly petioled, 1–2 in. long, $\frac{1}{12}$ – $\frac{1}{8}$ in. broad, subobtuse, narrowed to the base, denticulate upwards, firmly herbaceous, glabrous, minutely dotted. Inflorescence terminal, a foot long ; whorls distant, 4–6-flowered. Calyx pubescent, $\frac{1}{4}$ in. long ; upper tooth broad ; the others subulate from a broad base. Corolla whitish, $\frac{3}{4}$ in. long ; lobes as long as the tube. Stamens exserted.

Lower Guinea. Angola : district of Pungo Andongo, *Welwitsch*, 5769.

1. **Geniosporum paniculatum**, *Baker*. Add :—

Var. *debile*, Hiern. in Cat. Afr. Pl. Welw. i. 853. A weak plant hanging over rocks.

Lower Guinea. Angola : Pungo Andonga ; Casalala Stream, near Pedra Songue, *Welwitsch*, 5527.

1a. **Geniosporum strictum**, *Hiern in Cat. Afr. Pl. Welw. i. 852*. An erect smooth herb, 2–3 ft. high, with pubescent stems. Leaves subsessile or shortly petioled, 2–4-nate, oblanceolate, 1–2½ in. long, firm, serrate, glabrous. Inflorescences racemose, terminal and axillary, the end one 2–6 in. long ; whorls many-flowered ; pedicels pubescent, $\frac{1}{10}$ in. long. Calyx obliquely campanulate, under a line long, pubescent. Corolla $\frac{1}{5}$ in. long ; lips as long as the tube. Stamens exserted.

Lower Guinea. Angola : district of Huilla, *Welwitsch*, 5499.

5a. **Geniosporum Mutamba**, *Hiern in Cat. Afr. Pl. Welw. i. 854*. A perennial herb, with an edible tuberous root. Stems trailing, with branches 2 ft. or more long. Leaves shortly petioled or subsessile, ovate or oblong, 1–4 in. long, obtuse, rounded or cuneate at the base, thin, hispidulous and punctate, remotely serrulate. Inflorescence racemose, oblong, terminal, 1–2 in. long. Calyx $\frac{1}{12}$ in. long, pubescent, shallowly lobed. Corolla red-violet, $\frac{1}{4}$ in. long.

Lower Guinea. Angola : district of Huilla, wild and cultivated about Lopollo, *Welwitsch*, 5496, 5590.

4. **Moschosma riparium**, *Hochst*. Add: *Basilicum myriostachyum*, O. Kuntze, Rev. Gen. ii. 512 ; Hiern in Cat. Afr. Pl. Welw. i. 858.

10a. **Acrocephalus Goetzei**, *Gürke in Engl. Jahrb. xxviii. 471*. An undershrub with villous stems. Leaves shortly petioled, lanceolate, 1½–3 in. long, acute, entire, narrowed to the base, villous on both surfaces. Heads terminal, subglobose ; outer bracts stalked, whitish-blue, reaching 1½ in. long ; flower-bracts $\frac{1}{5}$ – $\frac{1}{4}$ in. long. Calyx 2-lipped ; lips entire.

Mozamb. Dist. German East Africa : Uhehe ; plateau near Mgololo, 4500 ft., *Goetze*, 764.

25. **Acrocephalus dissitifolius**, *Baker*. Hiern, in *Cat. Afr. Pl. Welw.* i. 856, refers the number on which this is founded to *A. cylindraceus*, *Oliv.*

28. **Acrocephalus sericeus**, *Briquet*. Add:—

Var. *teucroides*, Hiern in *Cat. Afr. Pl. Welw.* i. 857. A variety approaching *A. Heudelotii*, *Briquet*.

Lower Guinea. Angola: Pungo Andongo; Sobato Quibonga and near Quilanga, *Welwitsch*, 5551.

29. **Acrocephalus hyptoides**, *Baker*. The numbers on which this was founded are cited by Hiern in *Cat. Afr. Pl. Welw.* i. 857, under *A. minor*, *Briquet*.

33a. **Orthosiphon petrensis**, *Hiern in Cat. Afr. Pl. Welw.* i. 859. An erect rigid pubescent perennial herb, with stems 1–1½ ft. long. Stems simple or little branched. Leaves sessile, narrowly elliptic, 1–2 in. long, serrulate, obtuse or subacute, cuneate at the base. Inflorescence racemose, terminal, simple or branched, 4–6 in. long; whorls 4–6-flowered. Calyx campanulate, $\frac{1}{5}$ – $\frac{1}{4}$ in. long; upper tooth broad, the others small. Corolla $\frac{3}{8}$ in. long; lips very small. Anthers and style exserted.

Lower Guinea. Angola: district of Huilla, *Welwitsch*, 5494.

41. **Orthosiphon Welwitschii**, *Rolfe*. Add to the varieties named var. *angolensis*, Hiern in *Cat. Afr. Pl. Welw.* i. 859 (*O. adornatus*, var. *angolensis*, *Briquet* in *Engl. Jahrb.* xix. 176).

34a. **Æolanthus Goetzei**, *Gürke in Engl. Jahrb.* xxviii. 467. An undershrub. Leaves sessile, lanceolate, 1–2 in. long, subacute, rather fleshy, entire or slightly serrate, pubescent on both surfaces. Cymes capitate, congested in terminal racemes; bracts oblong, obtuse, $\frac{1}{4}$ – $\frac{1}{3}$ in. long, violet, pilose. Calyx $\frac{1}{6}$ in. long, campanulate, pilose. Corolla not seen.

Mozamb. Dist. German East Africa: Uhehe; plateau near Mgololo, 4500 ft., *Goetze*, 762.

11a. **Plectranthus Stuhlmanni**, *Gürke in Engl. Jahrb.* xxviii. 469. Leaves shortly petioled, broadly lanceolate, 1–3 in. long, acute, narrowed to the base, crenate-serrate, quite glabrous. Inflorescence racemose, lax, 2–4 in. long; whorls 6-flowered; pedicels $\frac{1}{5}$ in. long. Calyx campanulate, pubescent; upper tooth broadly deltoid, acuminate, the others lanceolate-deltoid.

Mozamb. Dist. German East Africa: Ukami; South Uluguru Mountains at Dandumi Brook, *Stuhlmann*, 9921.

11b. **Plectranthus luteus**, *Gürke in Engl. Jahrb.* xxviii. 468. An undershrub. Leaves shortly petioled, lanceolate, 2–4 in. long, acute, serrate, narrowed to the base, glabrous on both surfaces. Whorls distant, 6-flowered; pedicels $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Calyx $\frac{1}{8}$ in. long at

flowering, $\frac{1}{5}$ – $\frac{1}{4}$ in. at fruiting; upper tooth suborbicular; lateral teeth deltoid, cuspidate; lower teeth longer, lanceolate-deltoid, acuminate. Corolla golden-yellow.

Mozamb. Dist. German East Africa: Ukami; South-east Uluguru Mountains, in Bergur Forest, 4800–5600 ft., *Stuhlmann*, 8790.

11c. **Plectranthus Goetzei**, *Gürke in Engl. Jahrb.* xxviii. 469. Stem pubescent, $1\frac{1}{2}$ –2 ft. long. Leaves shortly petioled, lanceolate, 2–4 in. long, acute, subentire, pubescent on both surfaces. Inflorescence racemose, terminal, 6–8 in. long; whorls 10–24-flowered; pedicels $\frac{1}{3}$ – $\frac{1}{2}$ in. long. Fruit-calyx pubescent, $\frac{1}{5}$ in. long; upper tooth broadly ovate, the others deltoid, acuminate. Corolla pale blue.

Mozamb. Dist. German East Africa: Uhehe; plateau near Rungembe, 5200 ft., *Goetze*, 721.

36a. **Plectranthus monticola**, *Gürke in Engl. Jahrb.* xxviii. 468. An undershrub about 3 feet high. Leaves distinctly petioled, suborbicular, 1 in. long, obtuse, narrowed to the base, crenate, glabrous on both surfaces. Inflorescence racemose, lax, 2–4 in. long; whorls 8–10-flowered; pedicels $\frac{1}{5}$ – $\frac{2}{5}$ in. long. Fruit-calyx pubescent, $\frac{1}{3}$ in. long; upper tooth ovate; the others lanceolate-deltoid. Corolla pale blue.

Mozamb. Dist. German East Africa: Ukami; Central Uluguru Mountains, near Lukwangulu, 7800 ft., *Stuhlmann*, 9166.

37. **Plectranthus microphyllus**, *Baker*. The name *microphyllus* having been used by Gürke for a species described below, this one may be renamed **Plectranthus porpeodon**, *Baker*, from its incurved lateral calyx-teeth, which close over the ripening fruit.

46a. **Plectranthus andongensis**, *Baker*. An erect apparently perennial herb. Stems simple or nearly so, pubescent. Leaves petioled, ovate, 2–3 in. long, narrowed to the obtuse tip and the base, crenate, slightly pubescent. Cymes forming a terminal panicle $\frac{1}{2}$ ft. long, many-flowered; pedicels up to $\frac{1}{8}$ in. long. Calyx $\frac{1}{12}$ in. long, glandular-pubescent; upper tooth broad; lateral teeth small; lower connate nearly to the tip. Corolla glabrous, $\frac{1}{3}$ in. long.—*Germanea andongensis*, Hiern in *Cat. Afr. Pl. Welw.* i. 862.

Lower Guinea. Angola: district of Pungo Andongo, *Welwitsch*, 5543.

48a. **Plectranthus microphyllus**, *Gürke in Engl. Jahrb.* xxviii. 467. An erect herb, 8–12 in. high. Leaves shortly petioled, broadly ovate or suborbicular, $\frac{1}{2}$ –1 in. long, acute, minutely toothed, pubescent on both surfaces. Whorls distant; cymes 1–3-flowered; pedicels long. Calyx in fruit $\frac{1}{5}$ in. long; upper tooth deltoid, acute; lateral teeth broadly deltoid, acuminate; lower longer, deltoid, acuminate.

Mozamb. Dist. German East Africa: Ukami; East Uluguru Mountains, in clearings and on waste fields in the forest region, 4200 ft., *Stuhlmann*, 8748.

3a. **Solenostemon robustus**, *Hiern in Cat. Afr. Pl. Welw. i. 864.*
A robust herb, several feet high. Stems pubescent and minutely glandular. Leaves distinctly petioled, ovate or ovate-oblong, $2\frac{1}{2}$ –6 in. long, obtuse, crenate, yellowish-green, glabrescent. Cymes sessile, forming a terminal pyramidal panicle a foot long; pedicels up to $\frac{2}{3}$ in. long. Calyx campanulate, $\frac{1}{5}$ in. long; lobes deltoid, the top one rather broader than the others. Corolla $\frac{1}{2}$ in. long.

Lower Guinea. Angola: Pungo Andongo; from Lombe to Condo, *Welwitsch*, 5538!

6a. **Solenostemon niveus**, *Hiern in Cat. Afr. Pl. Welw. i. 864.*
A shrub 3–4 ft. high and with softly pubescent branches. Leaves petioled, suborbicular, 2–4 in. in diam., shortly narrowed to the base, crenate, rather thick, deep green, pubescent. Panicle thyrsoid, 3–12 in. long; cymes crowded, subsessile or shortly stalked; pedicels $\frac{1}{5}$ – $\frac{1}{3}$ in. long. Calyx campanulate, $\frac{1}{6}$ in. long; upper tooth ovate, the others lanceolate. Corolla snow-white, $\frac{1}{2}$ in. long.

Lower Guinea. Angola: district of Bumbo, *Welwitsch*, 5619.

5a. **Coleus ulugurensis**, *Gürke in Engl. Jahrb. xxviii. 470.*
Stem pubescent. Leaves shortly petioled, broadly ovate, $\frac{1}{2}$ –1 in. long, subobtuse, narrowed to the base, crenate, pubescent on both surfaces. Whorls remote, many-flowered. Fruit-calyx $\frac{1}{5}$ in. long; upper tooth ovate; lateral teeth ovate-orbicular; lower lanceolate, acuminate, connate.

Mozamb. Dist. German East Africa: Ukami; North-east Uluguru Mountains, near Kitope, 3900 ft., *Stuhlmann*, 9060.

26. **Coleus Schweinfurthii**, *Baker, not of Vatke*, is to be renamed **C. Sodalium**, *Baker*.

8. **Salvia simensis**, *Hochst. ex Avetta in Nuovo Giorn. Bot. Ital. xxi. 335*, is a species founded on Schimp. Pl. Abyss. Exsicc. No. 2462, of which neither description nor specimen can be found at Kew, but which is said by Avetta to be very common in Shoa.

Nile Land. Abyssinia, *Schimper*, 2462. Shoa; Antoto, *Ragazzi*.

64a. **Leucas Mackinderi**, *S. Moore in Journ. Bot. 1900, 206.*
Stems erect, branched, closely leafy, densely hairy. Leaves shortly petioled, ovate or ovate-oblong, $1\frac{1}{2}$ –4 in. long, obtuse, deeply crenate, hairy on both surfaces. Whorls subdistant, many-flowered, 1 in. in diam.; outer bracts linear-lanceolate, as long as the calyx. Calyx pubescent; tube $\frac{1}{3}$ – $\frac{1}{2}$ in. long; throat oblique; teeth 8, deltoid-mucronate. Corolla white; tube $\frac{1}{3}$ – $\frac{1}{2}$ in. long; lips as long as the tube.

Nile Land. British East Africa: Mount Kenia, *Mackinder*.

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ERRATA.

- Page 2, line 28 for appear read appears
 ,, 21, ,, 5, for Leaves sessile read Upper leaves sessile or subsessile, lower stalked
 ,, 36, ,, 20, for and read und
 ,, 43, ,, 16 from bottom, for *T. spicata* read *B. spicata*
 ,, 50, ,, 15, for petals read petioles
 ,, 52, lines 31 and 32, transpose the figures 3 and 4
 ,, 79, line 4, for 26 read 25
 ,, 88, ,, 10, for obvate read obovate
 ,, 95, ,, 17 from the bottom, for scorpiod read scorpioid
 ,, 180, ,, 23, for trinervis read trinervia
 ,, 209, ,, 26, for spp. n. 2-4 read sp. n. 4

- Page 222, line 17, *for pair read pairs*
 „ 231, „ 12, *for glabrescent read glabrescent*
 „ 245, „ 4 *from the bottom, for Zwei. read Zwei*
 „ 273, „ 26, *for Perfect stamens 2 read Perfect stamens 4*
 „ „ „ 27, *for Perfect stamens 4 read Perfect stamens 2*
 „ 277, „ 16, *dele 5756 !*
 „ 284, „ 16, *after as insert long as*
 „ 297, „ 13, *dele 5656 !*
 „ „ „ 9 *from the bottom, dele 5662 !*
 „ 304, „ 12 *from the bottom, for Hochgeberigsfl. read Hochgebirgsfl.*
 „ 320, „ 2 *from the bottom, for Mossamb, read Mossamb.*
 „ 325, „ 2, *dele 5665 !*
 „ 327, „ 17, *for Comptes-rendus. read Comptes-rendus*
 „ 331, „ 9 *from the bottom, for Beauv, read Beauv.*
 „ 352, „ 9 *from the bottom, for Fruit read Calyx*
 „ 376, „ 13, *for C. read O.*
 „ 411, „ 27, *for Circeea read Circeea*
 „ 423, „ 7 *from the bottom, for gymnostomum read gymnostomus*
 „ 425, „ 4, *for etevaldianus read eetveldeanus*
 „ 430, „ 20, *dele C. rupestris, Hochst. in Schimp. Pl. Abyss. No. 2172.*
 „ 451, „ 1, *for schimperi read Schimperi*
 „ 528, „ 21 *of central column, for Afromendonica read Afromendoncia*